

# TOP BRAND



**THE  
TRUEST      SUPER      VALUE.**

Manufacturers,  
THE ADELAIDE CHEMICAL & FERTILIZER CO., LTD.,  
Currie Street, Adelaide.

## OVER 5,000 FARMERS

are members of the

**Agricultural Bureau,**

**ARE YOU?**

If not, join a Branch at once. If the nearest Branch is not within reasonable distance of your Home, write to the Department of Agriculture for particulars as to how to form a Branch.

**It is to your interest to do so.**

# THE JOURNAL

OF THE

## Department of Agriculture

### OF SOUTH AUSTRALIA.

No. 10.

MAY, 1918.

VOL. XXI.

*Published Monthly by the Department of Agriculture.*

Edited by H. J. FINNIS.

CONTENTS.	PAGE.
POINTS FOR PRODUCERS .. .. .	750-753
INQUIRY DEPARTMENT.. .. .	754-758
ROSEWORTHY AGRICULTURAL COLLEGE—HARVEST REPORT, 1917-1918 ( <i>continued</i> ) .. .. .	759-766
EXPERIMENTAL FARM HARVEST REPORTS .. .. .	767-781
THE GROWING OF LUCERN .. .. .	782-796
AGRICULTURAL BUREAU CONFERENCES ( <i>to be continued</i> ) .. .. .	797-808
ADVISORY BOARD OF AGRICULTURE.. .. .	809-810
DAIRY AND FARM PRODUCE MARKETS .. .. .	811
THE AGRICULTURAL OUTLOOK.. .. .	812
RAINFALL .. .. .	813-814
AGRICULTURAL BUREAU REPORTS.. .. .	815-840

All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

**Notice re Copyright.**—The Copyright in all articles in this Journal is vested in the Crown, and any person reproducing or republishing the said articles without permission from the Hon. Minister of Agriculture will be liable to be proceeded against.

E. A. ANSTEY,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### River Murray Conference.

Tuesday, 21st, and Wednesday, 22nd May, are the days on which the Conference of River Murray Branches is to be held at Berri. From the point of view of the irrigationist it is difficult to overestimate the importance of this gathering. The management of an irrigation block is a highly specialized undertaking. Not only has the blocker to wage an unceasing war against Nature, but economic conditions demand his constant attention. The problems of distribution are as pressing as the problems of production. These facts form a bond between settler and settler, settlement and settlement. It is on this account that the Agricultural Bureau is so peculiarly fitted to play so important a part on the Murray. Apart altogether from its educational aspect the annual Conference forms a mouthpiece for the whole of the Murray settlements, and the voice of the Murray should be heard in the land.

### Selected Seeds from Roseworthy Agricultural College.

So heavy has the demand been for the selected and graded seed grown at the Roseworthy Agricultural College, that of the large number of varieties of wheats, barleys, oats, and field peas which were offered for sale for the 1918 seeding, the only seeds still available are small quantities of King's White wheat, and Roseworthy Oregon and Shorthed barleys. King's White is a College selection from King's Early. It is one of the earliest wheats grown, is suitable for hay or grain, and is hardy, rust-resisting, and non-shattering. Roseworthy Oregon is one of the best Cape barleys for early green feed, as it makes rapid growth in the autumn and early winter months. It is a mid-season variety, and a prolific yielder. Roseworthy Shorthed, like the preceding variety, has been tested over large areas for a number of years. It is a heavy stooler, vigorous and hardy, and is regarded as the best grain-yielding barley under Roseworthy conditions.

### Sugar Beet in South Australia.

With the object of determining the suitability of certain districts for the production of sugar beet, and also with the idea of arriving at some definite data in regard to the cost of producing that crop, the Department of Agriculture has made arrangements for small areas of beet to be grown during the coming season. Plots are to be put in at Millicent, on the property of Mr. J. J. Mullins; Penola, on Mr. P. H. Kilsby's holding; Glencoe, on Mr. J. Dow's property; and at Mount Gambier, on the farm of Mrs. E. Carter. The suitability of the reclaimed swamp land of the River Murray for this crop will also be tested, the land selected being on the farm of Mr. P. H. Pickering, at Mypolonga.

### Field Peas, Tares, and Vetches.

"The most suitable time to sow field peas," says the Director of Agriculture, in reply to a correspondent, "will depend very largely on the particular use you wish to put them to. If you wish to secure heavy

podding, with a view to harvesting the grain, it is dangerous to sow peas too early, because they then run the risk of being caught by late frosts when in bloom. If at all possible, in your district I should be inclined to sow peas early in August. On the other hand, if your aim is to feed off the peas in the green stage, the earlier you sow them in the autumn the greater will be the bulk of green forage produced. You could, in these circumstances, sow the peas towards the end of the present month, providing there was sufficient rain to bring on a satisfactory germination. Peas can be grazed green with great advantage. The best time to do this would be when the pods are firm. If they are not grazed down too hard, and if later rains follow, they will make a second growth. In exceptional cases I have even known them to carry a good crop of grain as a second growth. I do not wish to imply, however, that this is at all general. Many farmers who do not care to go to the trouble of harvesting peas, feed them off dry in the field. You will find that either pigs or sheep will in this fashion account for very nearly all the grain present. It should be pointed out that peas are essentially a crop adapted to well-drained soils sufficiently rich in lime, and it is questionable, in the circumstances, whether you are likely to get the best possible results from this crop. As to tares or vetches, they are generally more at home on relatively heavy land. I think they are worth testing in your district, although, unfortunately, the seed is very expensive. They form an exceedingly good grazing crop, and, if carefully handled, give rise to a good aftermath. Probably the best way to handle vetches is to sow them in a hay crop; the result in hay will form a better foodstuff, owing to the admixture of vetches, and if sufficient rain falls subsequently to cutting the hay crop, the vetches will give a very good second growth.

#### Filling the Woolpacks.

The shortage of shipping space, and the difficulty in obtaining a sufficiency of woolpacks, has made necessary a revision of the old practice of lightly filling the packs. This matter was referred to by the Chairman of the Advisory Board of Agriculture (Mr. Geo. Jeffrey), in the course of his opening address at the recent Conference of Upper Northern Branches of the Agricultural Bureau. "The more wool-growers can get into each individual pack the better," he said. "Before last season the Prime Minister made the request that bales should be tightly filled, and it was well responded to, but this year it will be more than ever necessary to increase the weight of the bales." This appeal should not fall on deaf ears. A greater weight of wool can be shipped in tightly-compressed bales, and the best interests of the growers themselves and of the Commonwealth as a whole will be met by utilising to its utmost capacity the amount of shipping space that is available.

#### "The Scottish Journal of Agriculture."

No. 1, volume 1, of *The Scottish Journal of Agriculture* was issued in January, 1918. "The publication of the paper could not, I think, take place at a more opportune time," says the Secretary for Scotland

(Right Hon. Robert Munro, K.C., M.P.), in the course of the introduction. "As the instrument for the development of both agriculture and forestry in Scotland, the Board of Agriculture can, by means of the *Journal*, provide much useful information to its readers, and can stimulate and popularize these vital industries. . . . A new outlook has been compelled by the war. The essential value of agriculture and forestry to the country is at last realized. The national danger involved in their neglect is at last appreciated. Their complementary character is at last understood. By means of these industries the security of the nation can be assured, and a robust and industrious peasantry settled upon the land.

#### Maize for Ensilage.

Under the most favorable conditions, the best time to cut maize for ensilage is when the grain is in the early dough stage. This, however, can apply only to those localities in which summer rain is abundant, or in which irrigation is regularly practised, says the Director of Agriculture. In districts in which irrigation is not possible, and in which the summer rainfall is light, it would be wiser to cut the maize as soon as the leaves begin to show the first signs of wilting under the influence of hot summer weather.

#### A New Thistle.

When in the South-East in April last, the Botanical Assistant (Mr. H. W. Andrew) came across a thistle which hitherto does not appear to have been recorded from any part of Australia. This plant has since been identified as *Carthamus glaucus*, Bieb. (*Kentrophyllum glaucum*, Fisch. et Mey.), a native of the Eastern Mediterranean. In general appearance, it closely resembles the saffron or woolly star thistle, *Carthamus lanatus* (*K. lanatum*), but differs from it principally in having purple instead of yellow flowers, and, in addition, the flower heads and achenes (or seeds) are smaller than those of the saffron thistle. Although this plant does not appear to have been recorded in Victoria, it would not be surprising if it were found to be growing in that State, as it is very plentiful indeed in the South-East, covering thousands of acres. No doubt in the past it has been generally confused with the saffron thistle, so common in many other parts of the State.

#### Bunt in Wheat.

Replying to a correspondent, writing from World's End Creek, for information respecting smut in wheat, the Director of Agriculture (Professor Arthur J. Perkins) said:—"I notice that you complain that in your district smut was very prevalent in the crops last year, even in the case of those that were pickled, and you wish to know whether any reason can be given for this unfortunate condition of affairs. In the first place, it would be necessary to know whether you are referring to 'loose smut,' which appears early in the season, before the grain is ripe, or to what is more generally known as 'bunt,' which is easily recognised by the characteristic of a disagreeable odor which it emits. Generally speaking, pickling is without effect against 'loose smut,' since it is not so much the grain that is affected, as the land on which the crop is sown.

'Bunt,' however, can, in my experience, be completely checked by an efficient pickling, and if, in this direction, you and your neighbors have failed, apparently, in the past season, I can only attribute it to defective pickling. It would be interesting to know in this connection how you proceeded. The question of pickling has been referred to so often in the pages of the *Journal*, and by officers of the Department of Agriculture in different parts of the State, that it seems almost unnecessary to refer to it again. I shall, however, indicate briefly the precaution that should be taken when wheat is pickled. In the first place, pickling by immersion of a bag in a tub of bluestone solution is not effective. It is absolutely essential that the grain be thoroughly stirred up whilst in contact with the pickle, and I know of no more efficient method for the purpose than the old-fashioned floor pickling carried out thoroughly. I have very little confidence in the various pickling machines that are now in the market, because, in my view, they do not stir up the grain sufficiently for the purpose. In order to secure good results, you should, in my opinion, proceed as follows:—Place the grain to be pickled on a wooden floor, and pour over it a 1 per cent. solution of bluestone (1lb. of bluestone to 10galls. of water), until the solution runs freely away from the grain. The wheat should be turned over vigorously with wooden shovels, and, if necessary, a little more solution may be added from time to time. I must point out that for effective action it is not strength of pickle that counts, but the quantity you use in the mixing-up process. If your grain is somewhat badly affected with smut, do not increase the strength of the pickle, which would only have the effect of injuring the germinating powers of the grain, but use the 1 per cent. solution very freely. I am perfectly satisfied that if you follow out these instructions carefully, and if, in addition, you do not put your wheat back into dirty bags, and if your drill is clean and free from germs of smut, you will have no reason to complain of your crops next year. As a matter of precaution, it is wise to immerse old bags, into which the pickled seed is placed, into the pickle solution before filling them with grain."

#### Imports and Exports of Fruits, Plants, Etc.

During the month of April, 1918, 7,244bush. of bananas, 201bush. of pineapples, 216bush. of passion fruit, 936bush. of fresh fruits, 15,771 bags of potatoes, 1,398 bags of onions, 89pkgs. of plants, bulbs, &c., 453 empty wine casks, 100 empty cases, and 26pkgs. of bags were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these 36bush. of bananas (overripe), 3bush. of grapes (prohibited), and 48 bags of potatoes (diseased) were destroyed, and 100 empty cases, 26pkgs. of bags, and 28 empty wine casks were fumigated. Under the Federal Commerce Act 566pkgs. of citrus fruit and 175pkgs. of sultanas were exported to New Zealand. Under the Federal Quarantine Act 1,716pkgs. of plants, seeds, &c., were examined and admitted from overseas sources. Of these 2 cases of nutmegs were fumigated on account of the presence of weevil.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

## A HINT TO CORRESPONDENTS.

On April 3rd we received from Pinnaroo a request for a copy of the Department's leaflet on "Ensilage." One penny stamp was enclosed, but the letter was unsigned. This is not the first occasion on which we have received letters giving no indication of the name of the writer, and we therefore suggest that correspondents should endeavor to overcome that feeling of modesty which constrains them to hide their identity.

## VETERINARY INQUIRIES.

[Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.]

"L. F. C.," Minnipa, has filly, leg swollen from stifle down below the hock.

Reply—I agree with you that the patella is not dislocated. If it were the leg would be stuck out behind, and could not be voluntarily brought forward. You have probably an abscess in the region of the stifle to deal with, which would yield to repeated fomentations, lancing, and, later, blistering. She will probably grow out of it in the next year or so.

"H. F. K.," Peake, reports sheep becoming blind.

Reply—Your sheep are suffering from acute pernicious parasitic anaemia, which produces the conditions you describe in the eyes. Let them have a lick such as often prescribed in the *Journal of Agriculture*. Bleed the worst ones at the eye vein. Blow in occasionally a pinch of a mixture of ammonium carbonate 1 part, boracic acid 7 parts.

"H. S. A. B.," Talia, has sheep running at eyes and nose; drowsy appearance.

Reply—The symptoms of your young wethers point to a form of blood poisoning, caused by *Bacillus sporogenes*. Treatment—Bleed affected ones at eyes or thigh vein. Preventive—Give licks as described in *Journal of Agriculture*, and move sheep frequently so as to avoid contamination of herbage.

"A. J.," Veitch, reports dog eating poisoned rabbits.

Reply—The letters S.A.P. stand for strychnine, arsenic, phosphorus, I believe, so that a dog eating a rabbit poisoned by it should theoretically show the symptoms of one or all, namely, "jump up" convulsions of strychnine and acute gastro enteritis of arsenic, with heart failure of phosphorus. In practice he may vomit, and avoid a fatal dose, suffering only from diarrhoea and weakness. If he has a fatal dose treatment will be useless. If not, give a few grains of Condry's crystals in water.

"M. S. L.," Yarrock, Kaniva (Vic.), has gelding, 8 years old, suffering with chronic strangles.

Reply—If you can obtain local veterinary aid I would advise doing so, but if not you may find that dusting the running sore with a little Cooper's powder dip once or twice a week will bring about a cure. Mind and not get any in your eyes or mouth when using it. If you cannot get veterinary help, and it has not healed as you would wish in a few weeks, kindly write to me again.

"M. A. P.," Edillilie, has pigs, ruptured when being castrated; and sheep, stiff in hindquarters.

Reply—The pigs were ruptured, a weakness that often runs in families, so that it would be advisable to change the particular boar or sow. Details of the operation have often appeared in the *Journal of Agriculture*. Do not cut inner skin, but ligature with catgut before removing testicle. Dress with carbolic oil or friar's balsam; sew up outer skin in which cut should be as small as possible. The feeding before operation was the main cause of your trouble; they should always be fastened overnight unless cut before weaning, which is better. As a rule ruptured pigs can be converted into porkers without being cut. Sheep—Your trouble is probably the parasitic disease sarcosporidiosis, complicated by indigestible stinkwort. Try constant change of pasture, and a lick, such as prescribed in the *Journal of Agriculture*.

"W. H.," Yacka, reports death of calves through eating leaves of tobacco plant.

Reply—Tobacco tree will produce the symptoms described in calves. Treatment at first—Bleed 2qts., give 6ozs. Epsom salts in a pint of strong tea. Do not sling one mentioned, but give 4ozs. Epsom salts in a quart of marshmallow tea. Repeat for two or three days if necessary.

"A. D.," World's End Creek, had bull that when driven suddenly fell down and staggered when trying to rise; death followed in eight days.

Reply—The symptoms point to the bull's death being due to valvular disease of the heart rather than poison. Nothing could have been done for him.

"H. S.," Road Mail, Port Lincoln, has gelding, five years, running sore on shoulder blade.

Reply—The symptoms described in your letter point to the existence of a fistulous withler. No cure can be effected till the diseased tissue has been removed. The details of treatment have frequently been described in these replies, and if you look them up in the *Journal of Agriculture*, and follow them, you may effect a cure, but the simplest way of getting rid of the trouble would be to sell the horse.

"N.," Mundoorra Agricultural Bureau, reports wethers, good condition, affected with stiffness; swell very quickly, and death follows.

Reply—The weed is identified by Mr. Andrew, Assistant Government Botanist, as *Convolvulus erubescens*, a small native convolvulus or bindweed. All the members of this family have an irritant effect on the bowels, causing diarrhoea at first, and constipation later, but if there is sufficient other harmless fodder they are not, as a rule, fatally poisonous. This shows the necessity for additional feed for sheep. It may be that the irritating effect of the weed is the final factor with your sheep, but the symptoms point to sarcosporidiosis (see *Journal of Agriculture* frequently). Treatment—Frequent change of pasture, bleeding, licks, as prescribed in the *Journal of Agriculture*.

"Mrs. N. B.," Leslie's Creek, Longwood, has cow with swelling in centre of belly. You need not be alarmed at the swellings described, they are lymphatic, produced by the activity of the gland in milk. If you wish to treat them bathe with warm soapsuds after milking, taking care to dry them well, and give the cow a teaspoon of saltpetre in feed morning and evening for a week. Should you desire further information at any time I shall be pleased to supply it.

"Joseph M.," Canowie Belt, asks information as to how a stallion should be fed, and a stimulant for the hair of the mane.

Reply—The Agricultural Department issues bulletins on feeding which you would find of use if you wrote for them. Rations for a stallion have frequently been given in these replies. Speaking generally hardness of condition is much better



than fat, but the public require the latter. Daily allowance may be—Chaff 30lbs., crushed oats 6lbs., boiled barley 6lbs., hay 10lbs. A good hair stimulant is kerosine 1 part, coconut oil 8 parts, lightly rubbed in once daily.

"L. B. & L. H.," Alawoona, report death of horses; body and legs swollen.

Reply—The symptoms described point to poisoning by the weed called cress or spurious buckbush, *Gyrostemon cyclothea*, or another known as ragwort or *Senecio Jacobea*. Give the one that is ailing a tablespoon once daily of the following:—1lb. each of sulphate of iron, sulphur, saltpetre, gentian root, 1lb. each of linseed meal and sugar.

"E. C. K.," Second Valley, has sheep with discharge from nose, and ulcers and swelling on lower lip.

Reply—The symptoms described point to worms such as I was demonstrating a few days ago at Inman Valley. I would recommend Cooper's worm tablets, dosing as described on tin. For the sores rub with damp bluestone occasionally. For full details see forthcoming number of *Journal of Agriculture*.

"E. M.," Meribah, has horse with lump on shoulder; mare, blown and protruding intestines; and foal, very lame and tender.

Reply—The lump on the horse's shoulder is an enlarged gland, and requires to be cut out. Full directions have often been given in the *Journal*. The mare died of a ruptured colon, but the cause of this was probably eating the poison weed known as cress. Nothing could have been done for her. Do not mix Epsom salts and baking soda, they have opposite actions. Possibly the foal has been kicked or otherwise injured on the fetlock. Plaster well with Stockholm tar, and leave alone.

"L. C. S.," Rendlesham, has calves with stiff forequarters.

Reply—The symptoms described point probably to either tetanus or tenesmus, the former often takes quite a mild form in calves, and the latter is often induced by worms. If the former, no treatment will be required, but if the latter, may be given with advantage, and would do no harm if the diagnosis is incorrect, lysol two teaspoons, chloroform 20 drops, turpentine one teaspoon in a cup of milk once or twice a day for a few days.

"W. C. M.," Bondleigh, Native Valley, reports death of cows. Post-mortem showed lungs quite black, sloppy paunch, and moist bible.

Reply—The symptoms described are those often called by the foolish name dry bible, which, as your post-mortem showed, is a name and nothing more. The condition of the liver and gall in combination with other symptoms point to a condition known as septicaemia, brought about by the activities of *Bacillus sporogenes*. Should you have further cases I would advise the following treatment:—Bled from 3qts. to 4qts. at neck, give a drachm of calomel in a pound of molasses three times a day for two days, and once or twice a day for a few more if the bowels are not too loose. Follow this by 2ozs. of syrup of phosphate of iron in molasses or red wine twice a day for three days, once for six days.

"H. H. D.," Langhorne's Creek, has pigs, well fed, but do not thrive.

Reply—It is impossible to condense pig management into a letter, and I would advise you to get a book on the subject by the Principal, Hawkesbury College, New South Wales, or a smaller one that would meet your requirements for about 1s. 6d. by Saunders Spencer. In either work you will find prescriptions for medicines for both worms and lice. There is no doubt that your pigs suffer from the effects of both endo and ecto parasites, and your sties require a thorough cleansing with boiling water or fire. Pigs 100lbs. live weight will take a teaspoon of sulphur once or twice daily, or a tablespoon of turpentine with milk once daily, or two tablespoons kerosine once daily, better with milk.

"C. McG.," Port Lincoln, has horse with severe barb wire cut just above front knee joint.

Reply—The little lump you describe is probably a sac caused by an injury to an oil sheath, and it will be very difficult to remove it. Do not be tempted to try a knife on it, or you may get a permanently stiff knee. Rub in a bit of blue mercurial ointment about as big as a pea for some minutes every morning, and report progress after a month.

"R. L. S.," Green Patch, has horse with mange.

Reply—You will find full details of several dressings for mange in the *Journal of Agriculture*. You may find this suitable for your case—Damp the mangy spots, dust on calcium carbide, and cover with paper for a minute; repeat at intervals of a few days if necessary.

"D. M.," Glencoe E., has cow affected with red water.

Reply—Red water, such as you get in Mount Gambier district, is due to animal parasites in the blood working on blood altered in composition by soil and plant life, such as fern. Treatment—Give plenty of bran in feed, avoid fern country, and give the following as a drench twice daily till well:—Tr. arnica 20 drops, syrup of phosphate of iron 1oz., limewater 1qt. I gather from your letter that she is dry, if so I would fat her off as soon as possible.

"E. F. T.," Pungonda, reports stallion showing signs of founder, and breathing is short and quick.

Reply—I fear under the circumstances that I can be of very little help to you. The stallion foundered on account of severe digestive trouble, and under the circumstances you describe there is practically no hope of his recovery; in any case medication would be expensive and probably unsatisfactory. If you have a wet paddock you might turn him into it, but work is out of the question, and should the Society for Prevention of Cruelty to Animals find him at work I am afraid you would be incurring more expense. I am inclined to think that the soundest advice I can give you is to shoot him.

"E. O. D.," O'Loughlin, West Coast, reports death of pigs after castration.

Reply—Your pigs died of septic peritonitis. Either the first one you did was ill, and you carried the germs on the knife to the others, or your knife was infected, possibly from skinning a sheep. Kerosine without the salt is as good a dressing as you want, but if you get too much swelling in some cases use carbolic oil. Why keep pigs till three months before cutting them? They do much better if cut a fortnight before weaning.

"W. J. McD.," Mindarie, has horse that eats well but does not improve in condition.

Reply—You are right in supposing that your horse is suffering from worms. Spell for a few days, and drench with 1½pts. linseed oil with two tablespoons turpentine well shaken up in it; or, better still, give a six-drachm physic ball. After the purging is over give two tablespoons Fowler's solution of arsenic once daily in feed for a fortnight, stop a fortnight, and repeat for another.

"W. T. B.," North Bundaleer, Jamestown, reports mare that breaks into heavy, cold sweat on short journey; draught colt with one testicle; and grey gelding with swollen and sore penis.

Reply—The mare may have something wrong with her heart; try a course of Fowler's solution of arsenic. You do not mention the colt's age; the other testicle may come down, especially if he runs with mares. The gelding's penis will probably have to be amputated, as the swelling is a form of cancer, due to worms. Your best plan would be to get in communication with a private veterinary surgeon, who would be able to visit, advise, and operate.

"J. W. C.," Sandalwood, has horse that walks into fences, as though unable to see, and also slight discharge from nose.

Reply—There is something wrong with your horse's brain, but it would require a personal inspection to find out what. It would probably do it good to bleed 4qts. from the neck vein, and give tr. belladonna, 10 drops, twice daily for a fortnight.

"C. N.," Stanley Flat, Clare, reports mare, 4 years, showing signs of stiffness, loins tucked up, and twitching of facial muscles.

Reply—It is difficult to diagnose your mare's case without seeing her, but the symptoms point either to incipient tetanus or infectious anaemia. Probably by this time some definite symptoms have appeared. I would suggest putting her on bran only, and letting her have about 6ozs. Epsom salts daily in it. I shall be glad to hear further from you.

"H. C. P.," Honiton, Yorke Peninsula, has pigs with brown scales on both sides of body.

Reply—The symptoms of your pigs point to external parasites, such as lice or fleas. Wash them well with soap and water containing a little soda. Next day souse them in a liquid sheep dip diluted according to directions. Give them sulphur and charcoal in feed, as often recommended in these replies. Disinfect sties with boiling water and soap, and whitewash all over, putting 2ozs. carbolic to each gallon of whitewash.

"R. H.," Port Broughton, has horses unable to drink; when trying to do so the water comes down through the nostrils, and causes them to cough.

Reply—Your mares seem to be suffering from the throat paralysis that accompanies infectious anaemia. Isolate them, feed mostly on sloppy bran and long hay. Steam their heads with a teaspoon of eucalyptus oil daily. Rub the throats with liniment daily, and put a tablespoon of the following mixture on the teeth twice daily:—Camphor 1oz., ext. belladonna 1oz., P. glycorrhiz. 2ozs., menthol 2 drachms, pic. liq. 8ozs. It is quite possible your heifer died of black leg or poison weed.

"E. E. R.," Narridy, has horse that lies down, refuses to eat; also horse that ran a stake into the joint above the fetlock; leg is now swollen, and discharging matter.

Reply—Your horse is suffering from partial paralysis of the large bowel, accompanied by impaction. Feed on bran mashes only for a few days. Give tr. nux vomica, 10 drops, three times a day for a fortnight, and if not well then write again. Blood poisoning has set in with the staked horse. Poultice with bran and linseed or marshmallow till discharge ceases, then dress with arnica lotion, 1 to 20, twice daily for a few days. Give 10 drops tr. arnica on tongue three times a day for a week. I am afraid this case is likely to do badly.

"W. L.," 32, Kenilworth Road, Parkside, has cow with tuberculosis.

Reply—All the symptoms of the cow point to ovarian, uterine, and generalised tuberculosis. The action to be taken is to call in the Inspector of Stock, who will advise as to course to be pursued. In the meanwhile the animal should be isolated.

"H. S. A. B.," Brentwood, seeks information as to cattle chewing bones of poisoned rabbits; also a cow recently calved, whose milk is tinged with blood; and ewes weak across loins, eyes fixed appearance, and die within two or three days.

Reply—The bones of rabbits poisoned by phosphorised pollard remain fatally dangerous to stock for many months. The tinge of blood in the milk in the old cow is due to rupture of a very small vessel, and is common in old cows. When such occurs it is an indication that it will be better not to calve her again. No treatment is necessary, but if desired 10 drops tr. arnica may be given morning and evening for three days. The deaths of ewes are most likely due to anaemia, brought about by blood cell parasites, as often pointed out in these replies, and in a direct reply to your previous inquiry on the subject. Probably the best method of treatment will be preventive by giving a lick such as described in an article in the *Journal of Agriculture*, "Worms in Sheep."

#### HORTICULTURAL INQUIRIES.

[Reply supplied by Mr. GEO. QUINN, Government Horticultural Instructor.]

"H. J. M.," Willunga, seeks a cure for lumps on almond trees, very similar to club root in pears.

Reply—The cause of these callosities—more common when the trees are planted in sandy soils—is not yet definitely known. Professor Osborn has been supplied with specimens for investigation purposes. In the meantime he advises you to cut away, carefully collect, and burn all the lumps you can reach; afterwards dressing the cuts with tar, and as a further precaution, scatter powdered sulphate of iron around the spots and stir it into the soil where the callosities were located. The suspected cause is the bacterial disease known in America as "crown gall."

## ROSEWORTHY AGRICULTURAL COLLEGE HARVEST REPORT—1917-18.

[By W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S., Principal of  
Roseworthy Agricultural College.]

*(Continued from page 691.)*

### THE WHEAT HARVEST.

Owing to the lateness of the seeding season and the spell of hot weather experienced in the spring, the wheat crops in 1917 did not yield anything like as well as was expected. Crops that were sown in the early part of May and later sown early varieties withstood the conditions well, and returned good yields of fairly plump grain; but the late sown fields, particularly those carrying mid-season and late types, such as Marshall's No. 3 and Yandilla King, proved very disappointing. To grasp the facts properly we must go back to the autumn and recall the conditions then existing. By the end of May less than 100 acres of wheat had been sown, the fallows were too wet to work or carry stock, and the dandelions were growing apace. The position was serious in the extreme, for every acre of fallow required to be reworked in order to bring the rain-battered surface to a tilth and destroy the weeds. Moreover, the dampness of the atmosphere made it almost impossible to kill the weeds even with the plough, and many acres had to be drilled in before they were properly cleaned. The later types, being slower in growth, were handicapped by being forced to compete with rank growing dandelions, and they never recovered the lost ground. The quick growing early kinds, however, struggled through, and gave a better account of themselves. Quite apart from the weeds, however, the time occupied in the working and reworking of the seed bed between the showers delayed drilling to such an extent that the soil had reached its winter temperature before the seed was sown. By resorting to the old system of broadcasting and scarifying instead of drilling and harrowing, a certain amount of time was saved; but the task was not completed till the last day of June, and I must confess that I was very far from being satisfied with the manner in which we had been forced to accomplish it.

In fairness to the farm crops, it should be noted that preference is always given to the experimental plots when both are claiming attention,

and the consequence is that the yields obtained from the experimental areas are very much in advance of the farm yields. And then again the experimental plots are sown with early wheats, whereas the farm yields carry a large number of varieties, some of which are known to be less prolific in this district than the earlier kinds, such as King's Early and Gluyas. The character of the grain produced this year was as a rule inferior, being small and somewhat pinched. This was particularly noticeable with the late wheats, the loss in grading some varieties being abnormally high. There was also unavoidable loss in harvesting the tough-eared wheats like Yandilla King, as the dehus were very heavy and the atmosphere was moist during the greater part of the day when the machines were at work. Knowledge of these circumstances will assist to an understanding of the discrepancy between the 1916 and 1917 wheat yields, and will give point to the argument in favor of placing chief dependence on early wheats in this district, even though they are liable to go down before the storm in seasons characterized by rough spring weather. The heaviest yield per acre obtained this year was 32bush. 59lbs. from a plot of Bonus, a selection from a Fan x Red Fife crossbred named Basil. The next best was Federation, with 29bush. 41lbs., and this was closely followed by Daphne with 29bush. 26lbs. and Caliph with 29bush. 10lbs.

From the tabular statement appended it will be seen that there were 368.543 acres under wheat, and that the average return from this area was 17bush. 48lbs. per acre.

TABLE XX.—*Summary of Wheat Returns, 1917.*

	Area. Acres.	Total Yield. Bush. lbs.	Acres. Yield. Bush. lbs.
Farm crops .....	231-520	3,452 54	14 55
Experimental Crops (one acre and over) .....	121-953	2,746 56	22 31
Totals .....	353-473	6,199 50	17 32
Experimental plots (under one acre) .....	15-070	360 50	23 57
Grand totals .....	368-543	6,560 40	17 48

In the following notes on the wheat fields it should be stated that the amount of seed sown was 2bush. and of superphosphate 2cwts. per acre. Further, all seed sown was "pickled" in a 1½ per cent. solution of copper sulphate.

## FIELD.—EBSARY'S A.

Details concerning the past history of this field are shown below:—

1899 .. Bare fallow	1905 .. Pasture	1912 .. Wheat, barley, and rye
1900 .. Wheat	1906 .. Bare fallow	
1901 .. Bare fallow	1907 .. Barley	1913 .. Barley
1902 .. Wheat	1908-10 Pasture	1914 .. Pasture
1903 .. Bare fallow	1911 .. Bare fallow	1915 .. Pasture
1904 .. Wheat		1916 .. Bare fallow

This field of 54 acres was not fallowed till October, and it turned up very rough. It was allowed to be in the furrow till February, when it was worked down with the crosskill clod crusher and heavy disc cultivator. It was worked again at the end of April with the fixed tine cultivator, and then kept clean with a flock of sheep. This field was also sown at express speed, the time occupied in drilling being two days. The seed and manure were broadcasted through the drill, and covered by scarifier and harrows. The variety sown was Gluyas, and after making a poor start it developed into a fine upstanding crop. Unfortunately, the paddock lies low, and a fair amount of the seed was drowned out, with the result that the crop was too thin for a high yield; but it is certain that had we delayed long enough to permit of more careful work in the seeding the land would never have been sown at all. Under the circumstances, and in view of the small outlay an average return of 16bush. 39lbs. is quite satisfactory.

TABLE XXI.—*Showing Particulars of Wheat Harvest in Ebsary's A, 1917.*

Variety.	Selection.	Area. Acres.	Total Yield. Bush. lbs.	Acres Yield. Bush. lbs.
Gluyas .....	9	27.177	407 59	15 1
Gluyas .....	10	18.855	363 37	19 17
Gloyas .....	11	2.937	43 24	14 47
Totals.....		48.969	815 0	16 39

#### FIELD.—GRAINGER'S C.

The past history of the field may be summarised thus:—

1907 .. Bare fallow	1911 .. Bare fallow	1915 .. Wheat
1908 .. Barley and oats	1912 .. Wheat	1916 .. Bare fallow
1909 .. Bare fallow	1913 .. Pasture	1917 .. Wheat
1910 .. Wheat	1914 .. Bare fallow	

Fallow ploughing in this field took place in August, and the surface was subsequently worked down with clod crusher and disc cultivators. Early in May it was scarified to a tilth, and a start was made with the drills on May 10th; but the inclemency of the weather and the prevalence of claypans interfered seriously with the work of seeding, as well as with the growth of the crop during the winter and early spring. The yield of Le Huguenot is about equal to the usual return secured from this variety at the College, but the low yields from the other varieties are indicative of the depressing effect of the continuous winter rains on land already surcharged with moisture. Portions of these plots were drowned right out, and in other parts the stand was

thinned out considerably. It is somewhat remarkable that a drought-resisting variety—College Eclipse—should have done so well in a season of heavy rainfall.

TABLE XXII.—*Showing Particulars of Wheat Harvest in Grainger's C, 1917.*

Variety.	Selection.	Area. Acres.	Total Yield.		Acre Yield. Bush. lbs.
			Bush.	lbs.	
College Eclipse .....	9	6-859	119	2	17 21
Le Huguenot .....	6	8-918	131	24	14 44
Correl's No. 7 .....	—	5-103	73	48	14 28
Basil .....	3	5-414	75	21	13 55
Federation .....	8	5-362	66	9	12 20
Totals .....		31-656	465	44	14 43

FIELD.—NOTTLE'S B.

*Previous History.*

1897 .. Bare fallow	1905 .. Bare fallow	1911 .. Wheat, oats, and
1898 .. Wheat	1906 .. Wheat and bar-	beans
1899 .. Wheat	ley	1912 .. Wheat, oats, and
1900 .. Bare fallow	1907 .. Pasture	barley
1901 .. Wheat	1908 .. Bare fallow	1913 .. Bare fallow
1902 .. Pasture	1909 .. Wheat, oats, and	1914 .. Wheat
1903 .. Bare fallow	lucerne	1915 .. Pasture
1904 .. Wheat	1910 .. Fallow	1916 .. Fallow

There are 156 acres enclosed in this field, and the land is in good heart, as evidenced by the wealth of feed which it produces when lying in pasture. The 1914 seeding was a failure, hence this year's crop was the first since 1912. The land was fallowed 6in. deep between the middle of June and end of September. The surface was immediately worked down with the clod crusher, and during November the disc cultivators were run over it. After harvest it was again cultivated, and this left a nice tilthy seed bed; but the drenching rains in May and June melted down the surface and rendered seeding operations excessively difficult. A start was made with the drills on June 2nd, and after many days of heavy plugging through a half-saturated seed bed the last plot was finished on the morning of Saturday, June 29th.

A glance at the appended table will show how seriously the wet seeding interfered with the yields.

TABLE XXIII.—*Showing Particulars of Wheat Harvest in Nottle's B, 1917.*

Variety.	Selection.	Area. Acres.	Total Yield.		Acre Yield. Bush. lbs.
			Bush.	lbs.	
Queen Fan .....	6 and 7	28-591	506	24	17 43
Daphne .....	4	9-338	162	6	17 22
Caliph .....	1	13-319	304	49	14 6
Canaan .....	4	5-432	76	36	12 56
Late Gluyas .....	9 and 11	47-935	620	3	12 36
Anvil .....	4	2-077	26	10	12 20
Marshall's No. 3B .....	8 and 9	25-093	309	21	11 49
Yandilla King .....	4 and 5	14-110	166	41	
Totals .....		150-395	2,172	10	14 24

## EXPERIMENTAL WHEAT CROPS.

The grain yields of the varieties grown on the permanent experimental fields and the selection plots in Field No. 16 are shown below:—

TABLE XXIV.—*Showing Yields of Varieties Grown on Experimental Areas in Plots of One Acre and Over, 1917.*

Field.	Variety.	Selection.	Area. Acres.	Total Yield. Bush. lbs.	Acre Yield. Bush. lbs.
No. 4 .....	King's White ..	10	58-102	1,395 13	24 1
Grainger's D— Reversion Plots ....	King's White ..	11	6-400	151 47	23 43
Grainger's C— Manure Plots .....	King's Red....	10	14-100	317 14	22 30
Grainger's A— Cultivation Plots....	King's Red....	10	24-559	481 9	19 35
Grainger's B— Depth of Ploughing Plots.....	King's Red....	11	5-726	101 12	17 40
No. 16 .....	Federation ....	9	1-027	30 29	29 41
" .....	Crossbred 53 ..	2	1-746	49 10	28 10
" .....	Cadet .....	6	2-244	55 52	24 54
" .....	Anvil .....	5	1-277	29 6	22 47
" .....	Cad .....	6	2-037	45 49	22 30
" .....	Queen Fan ..	8	1-010	22 18	21 55
" .....	Fortune .....	3	1-277	26 55	21 5
" .....	Yandilla King .	6	2-448	40 42	16 38
Totals.....			121-953	2,746 56	22 31

The next table indicates the grain-yielding capacity of the chief varieties, as shown by the returns secured from them, when grown under farm conditions in blocks of 5 acres or more. It also gives an idea as to their relative merits as wheat producers in this particular locality.

TABLE XXV.—*Showing Yields of Chief Varieties of Wheat Grown in 1917.*

Variety.	Area.	Highest Acre Yield.	Lowest Acre Yield.	Average Acre Yield.	Mean Acre Yield. 1915-1917.
	Acres.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
Gluyas .....	43-969	19 17	14 47	16 39	26 45
King's White .....	65-324	33 10	12 41	23 58	24 13
Late Gluyas .....	48-665	22 18	12 43	13 5	21 49
Queen Fan .....	29-601	21 55	17 43	17 52	20 51
Basil .....	6-219	27 55	13 55	15 44	20 5
King's Red .....	45-255	23 28	15 43	20 19	19 36
Caliph .....	18-319	16 38	16 38	16 38	19 36
College Eclipse .....	7-589	25 4	17 21	18 6	17 57

In Table XXVI. are given the yields of the latest selections in each year of the College bred or selected varieties. These yields are obtained from small areas in the experimental field. The low position occupied



by Gluyas and Late Gluyas varieties is due to the loss sustained through lodging, the reduction due to this cause being proportionately higher in the case of small plots than in larger blocks.

TABLE XXVI.—*Showing Yields of Latest Strains of College Hand-Selected Pedigree Wheats, Comparatively with those Obtained from Earlier Strains in Previous Seasons.*

Variety.	Selection.	Yields per Acre.				
		1917.	1916.	1915.	1914.	1913.
		Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
Queen Fan .....	8	21 55	22 32	11 40	—	9 55
Federation .....	9	29 41	29 30	8 13	—	6 22
King's White .....	12	22 33	14 30	16 43	15 46	8 30
Caliph .....	2	29 10	19 39	20 50	10 12	6 53
Marshall's No. 3B ..	10	21 38	28 15	9 46	—	9 39
Roseworthy Jonathan	9	16 18	35 49	6 21	—	6 16
Daphne .....	5	29 26	18 43	18 36	—	7 19
King's Red .....	12	23 20	19 4	10 42	10 21	8 39
Canaan .....	5	25 3	20 45	11 5	—	10 23
Gluyas .....	12	24 44	13 37	18 29	13 5	10 56
Bearded Gluyas ....	12	18 35	16 32	10 38	11 15	8 31
Late Gluyas .....	12	22 18	13 4	13 36	7 21	7 16
Anvil .....	5	22 47	23 16	8 35	—	5 22
College Eclipse .....	10	25 4	19 51	7 22	9 0	10 39
Carmichael's Eclipse.	10	19 51	16 27	7 48	7 13	7 55
Basil .....	4	27 55	22 34	11 2	5 9	10 19
Cad .....	5	22 30	31 32	6 48	5 47	—
Brindle .....	5	22 27	23 31	9 56	—	12 31
Yandilla King .....	6	16 38	34 28	6 21	—	6 4
Cadet .....	5	24 54	30 27	3 49	5 19	—
Fancy .....	5	21 22	17 24	17 38	—	8 8
College Comeback ..	10	22 24	16 26	8 56	5 12	7 19
Eureka .....	4	25 49	17 49	8 28	4 23	—
Le Huguenot .....	7	8 14	16 27	23 37	—	6 21

Variety.	Selection.	1912.	1911.	1910.	1909.	Means.
		Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
Queen Fan .....	8	23 6	22 35	34 48	—	20 54
Federation .....	9	22 13	11 52	25 48	33 20	20 52
King's White .....	12	26 53	17 0	23 27	29 10	19 24
Caliph .....	2	28 20	—	—	—	19 11
Marshall's No. 3B ..	10	21 36	7 37	26 38	27 22	19 4
Roseworthy Jonathan	9	24 55	10 26	24 21	27 24	18 56
Daphne .....	5	24 14	—	—	—	18 52
King's Red .....	12	27 34	12 37	22 43	33 41	18 45
Canaan .....	5	23 20	—	—	—	18 7
Gluyas .....	12	21 32	8 34	21 29	28 33	17 52
Bearded Gluyas ....	12	28 6	14 38	20 51	30 35	17 45
Late Gluyas .....	12	23 44	14 4	22 50	33 8	17 29
Anvil .....	5	26 16	—	—	—	17 15
College Eclipse .....	10	21 54	12 27	25 8	24 47	17 15
Carmichael's Eclipse.	10	22 53	26 53	28 21	22 50	16 43
Basil .....	4	23 0	—	—	—	16 40
Cad .....	5	—	—	—	—	16 39
Brindle .....	5	13 4	—	—	—	16 19
Yandilla King .....	6	17 27	—	—	—	16 12
Cadet .....	5	—	—	—	—	16 7
Fancy .....	5	10 43	—	—	—	15 5
College Comeback ..	10	17 27	8 4	29 12	19 16	14 53
Eureka .....	4	—	—	—	—	14 7
Le Huguenot .....	7	10 38	—	—	—	13 3

Of the new wheats included in the next table attention may be drawn to Fortune, Fane, and Ford. The two first-mentioned varieties are from the same female parent, but by different sires. Ford is a particularly promising variety, as it is descended from both Comeback and Crossbred 53, and appears to be a prolific yielder.

TABLE XXVII.—*Showing Yields of some New College Crossbred Wheats (1910 to 1912 Crosses).*

Variety.	Selection.	Pedigree.	Yield per Acre.			
			1917. B. lbs.	1916. B. lbs.	1915. B. lbs.	Means B. lbs.
Exquisite	1	Gluyas x Indian Runner x Gluyas (1910)	23 11	18 28	2 41	14 47
Evening	4	Gluyas x Indian Runner x Jona (1910)	23 29	29 27	23 5	25 20
Echo	4	Bearded Rieti x Gluyas x Jonathan (1910)	16 56	10 57	5 11	11 1
Fortune	3	Marshall's No. 3 x Indian Runner x Marshall's No. 3A x Jona (1911)	21 5	38 43	—	29 54
Fane	3	Marshall's No. 3 x Indian Runner x Marshall's No. 3A x Queen Fan (1911)	24 27	30 43	—	27 40
Ford	3	Fan x Comeback x Crossbred 53 (1911)	29 25	22 3	—	26 44
Flamen	3	College Eclipse x Indian Runner x Marshall's No. 3A x Queen Fan (1911)	20 5	15 9	—	17 22
Fort	1	Bearded Rieti x Gluyas x Jonathan x Gluyas (1912)	7 25	14 42	—	11 4
Faun	2	Kine's White x Jonathan x Gluyas (1912)	11 57	—	—	11 57

TABLE XXVIII.—*Showing Yields of Miscellaneous Wheats Grown in Field No. 16, 1917.*

Variety.	Selection.	Yield per Acre.		
		Area. Acres.	Bush.	lbs.
Bonus	4	0.848	32	59
Crossbred 53	2	1.746	28	10
Sevens	—	0.394	27	20
Lotts	1	0.128	26	42
Early Crossbred 53	2	0.255	23	8
Lotts' White	1	0.109	21	34
Neuman's Early	—	0.173	15	42

#### GENERAL WHEAT AVERAGES.

The average return for the year is just 18lbs. per acre below the mean yield for the previous 13 years. This will result in a reduction of the mean yield by 1lb., making the average for 14 years, 17bush. 49lbs. It is a matter for regret that in a season of abundant rainfall the average return should have the effect of depressing the mean yield instead of augmenting it; but climatic factors are beyond our control, and inasmuch as the lowest returns were derived from the crops grown on the best worked fallows the system of tillage cannot be held responsible. It was just one of those occasions when a farmer would vary his plans so as to reduce the proportion of late varieties to a minimum; but where seed wheat is being grown it is practically impossible to depart from pre-arranged schemes without dropping out varieties

that have already had endless labor spent upon them in the operations of selection, purification, and grading. All that can be said is that 1917 was only an average season as regards wheat yields, and below the average in respect of quality of grain. And in saying this of the College farm, I believe I am voicing the experience of a large number of farmers in the adjoining districts.

TABLE XXIX.—*Showing the Average Yields of Wheat on the College Farm, 1904 to 1917.*

Season.	Rainfall.		Area under Wheat. Acres.	Average Yield per Acre. Bush. lbs.
	"Useful."			
	Inches.	Total. Inches.		
1904	11-60	14-70	330-00	18 3
1905	14-23	16-71	212-00	24 11
1906	16-31	19-73	318-00	14 30
1907	13-96	15-13	178-00	13 20
1908	15-52	17-75	258-52	22 14
1909	21-15	24-05	328-47	25 5
1910	16-79	23-87	267-35	16 38
1911	9-45	13-68	234-98	14 17
1912	13-05	14-97	232-89	19 36
1913	10-82	15-66	333-07	6 32
1914	6-12	9-36	148-69	11 28
1915	18-33	19-76	367-271	21 13
1916	20-26	23-23	330-937	24 44
1917	17-25	21-86	353-473	17 32
Means for 14 years.....	17-58	14-55	—	17 49

In the final table I have summarised the mean yields of the various crops so that the productive capacity of the land may be quickly gauged. Chief reliance should be placed on the figures for wheat, barley, hay, silage, and berseem, as the rye and oat yields are usually from small areas, and the pea crop has only been cut for grain during the last two seasons.

TABLE XXX.—*Summarising Mean Returns from Various Crops Grown at Roseworthy College.*

Crop.	Period.	Average Yield per Acre.			
		T.	C.	L.	B. lbs.
Berseem clover	1912-1917.....	30	1	22	—
Ensilage	1905-1917.....	7	1	57	—
Hay	1904-1917.....	2	2	56	—
Peas	1916-1917.....	—	—	—	25 56
Barley	1904-1917.....	—	—	—	30 14
Oats	1905-1917.....	—	—	—	27 5
Rye	1909-1917.....	—	—	—	11 19
Wheat	1904-1917.....	—	—	—	17 49

To Mr. R. C. Scott (Experimentalist) and Mr. E. L. Orchard (Farm Superintendent) I am indebted for valuable assistance in the preparation of this report, and for their unflagging efforts to complete a protracted and tedious harvest.

## EXPERIMENTAL FARM HARVEST REPORTS.

### KYBYBOLITE EXPERIMENTAL FARM.

[By W. J. SPAFFORD, Superintendent Experimental Work, and  
L. S. DAVIE, Manager.]

This farm is situated in the hundred of Binnun, in the south-east of the State, and contains about 1,000 acres of land immediately surrounding the old Kybybolite Sheep Station. The land is more or less undulating, and is all arable; the great bulk of it contains a very large proportion of ironstone rubble, with its corresponding crop-raising difficulties, whilst the remaining portion is heavy-working "crabhole" land.

#### THE SEASON 1917.

This season was easily the worst cereal year that the farm has experienced, and the more or less failure of the crops was wholly due to the unusual distribution of the rainfall. The first four months of the year gave but little rain above the average for the period, and it was in February that the excess fell, so playing no part as far as the cereals were concerned. May produced 4.72in. of rain, which is practically 2½in. above the average for the month. This heavy fall water-logged the whole of the farm, and left pools of water in all of the hollows, which did not dry out in June, although only 1.33in. of rain fell in that month. In July 4.47in. were registered as against an average of 3.20in. for the month, which amount again flooded the farm. August and September rainfall was just average, but October and November gave considerably above average, thus keeping the land water-logged into November.

It has been our experience, and that of the whole district, that the cereals should be well started before winter conditions set in, if good crops are to be secured, but with a season as described above, the cold, wet weather set in much earlier than usual, thus restricting the area seeded early, and, contrary to ordinary experience, those crops well up were drowned out because the soil was waterlogged from May until November. Extensive surface draining has been practised at this farm to relieve the land of excessive water, but this year the surface was so waterlogged that horses could not be worked on it at the proper time of the year to do the work. The table below sets out in detail the

monthly rainfall at the farm for the year, together with that of six previous seasons, and the average for the past 12 years:—

*Rainfall Distribution at Kybyholite, 1906-1917.*

	Means, 1906- 1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	Means, 1906- 1917.
	In.	In.	In.	In.	In.	In.	In.	In.	In.
January .....	0.29	0.71	—	0.30	0.72	0.54	1.29	0.45	0.46
February .....	0.69	2.61	0.14	1.77	0.15	1.15	0.28	2.81	1.02
March .....	2.10	0.85	0.72	1.38	1.37	0.42	0.03	1.17	1.37
April .....	1.70	1.11	1.51	0.80	1.98	1.12	2.07	0.74	1.49
May .....	3.45	2.53	0.83	0.83	1.98	1.82	0.69	4.72	2.55
June .....	3.49	3.75	2.64	0.32	0.65	6.55	3.56	1.33	3.02
July .....	4.15	2.68	2.54	1.94	1.69	1.68	2.68	4.47	3.20
August .....	3.05	2.08	1.81	3.08	0.33	4.11	2.94	2.69	2.60
September .....	2.85	1.78	5.83	3.03	0.47	4.18	2.77	2.96	2.94
October .....	2.56	0.79	1.10	1.95	0.18	1.20	2.20	2.78	1.92
November .....	1.97	—	1.97	1.98	1.15	0.52	3.28	2.21	1.75
December .....	0.94	3.34	1.74	1.06	1.27	0.01	1.74	0.36	1.18
Total rainfall ...	27.24	22.23	20.83	18.44	11.94	23.30	23.53	26.69	23.60
Total "Useful" rain (April-November).	23.22	14.72	18.23	13.93	8.43	21.18	20.19	21.90	19.56

DISTRIBUTION OF "USEFUL" RAINFALL.

The distribution of the rainfall plays quite as great a part as does the total fall, and the next table sets out the distribution of that rain, which controls what the cereal crops are to be:—

*Distribution of "Useful" Rain in 1917, comparatively with the Means from 1906 to 1917.*

	1917.	Means. 1906-1917.
	In.	In.
Seeding rains (April-May) .....	5.46	4.04
Winter rains (June-July) .....	5.80	6.22
Spring rains (August-October) .....	8.43	7.55
Early summer rains (November) .....	2.21	1.75
Total "useful" rains .....	21.90	19.56

CROPS.

Despite the fact that the seeding conditions in the autumn were so bad, as usual many kinds of crops were grown, but as will be seen later, most of them were failures.

*Green Forage Crops.*—It has become a usual practice at this farm to sow cereals in the autumn, to be used as green feed. This has been found to be necessary because the natural feed does not grow until the spring, and without fodder supplied the livestock would be on short rations during the cold, wet part of the year.

This year 50 acres—consisting of Fields 3, 3a, and 13—were ploughed in April, and 44 acres of it (Nos. 3 and 13) were seeded with Algerian oats at the rate of 120lbs. to the acre, with 1cwt. superphosphate, before the end of the month. The remaining six acres (No. 3a) were sown with Cape barley at the rate of 3bush. to the acre with 1cwt. superphosphate on May 3rd. All fields germinated well, and gave some early feed, but much of it was soon drowned out, and none of it lasted like these crops do in an ordinary year. Field No. 3 was left and cut for hay.

*Hay Crops.*—About 77 acres were sown solely for hay, but when the crops were proving failures so early in the season it was decided to leave Field No. 3, originally sown with oats for green feed, as a crop for cutting for hay.

Field No. 2, containing about 24 acres, carried oats and flax in 1916, was ploughed up in June, and immediately sown to Calcutta oats at the rate of 80lbs. to the acre, with 1cwt. superphosphate. Field No. 15 (64 acres) had a wheat crop in 1916, was ploughed in May, and seeded with 62lbs. Algerian oats to the acre with 1cwt. superphosphate, from May 18th to June 13th. Fifteen acres were dressed with 16cwts. lime per acre, and 14 acres with 10cwts. lime per acre between ploughing and seeding. The yields of hay obtained from the above three fields are set out below:—

#### *Hay Yields—Kybybolite, 1917.*

Crop.	Field Grown. No.	Area. Acres.	Total Yield.			Yield per Acre.		
			T.	C.	L.	T.	C.	L.
Algerian . . . . .	3	19.43	13	14	28	0	14	13
Algerian . . . . .	15	63.21	30	5	0	0	9	64
Calcutta . . . . .	2	14.13	5	9	84	0	7	86
Farm average . . . . .	—	96.77	49	9	0	0	10	25

The farm average for hay—10cwts. 25lbs. per acre—is the lowest return that we have yet received for this crop, but this is so for all of our cereal crops. The next table gives the hay returns at Kybybolite since 1910:—

#### *Hay Returns, Kybybolite, 1910-1917.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.			Yield per Acre.		
	In.	In.		T.	C.	L.	T.	C.	L.
1910 . . . . .	23.35	21.08	106.13	88	19	28	0	16	85
1911 . . . . .	22.23	14.72	94.04	136	6	110	1	9	28
1912 . . . . .	20.83	18.23	26.59	67	7	70	2	10	76
1913 . . . . .	18.44	13.93	108.55	166	11	0	1	10	77
1914 . . . . .	11.94	8.43	109.00	90	1	0	0	16	59
1915 . . . . .	23.30	21.18	108.66	111	14	56	1	0	65
1916 . . . . .	23.53	20.19	77.35	135	1	0	1	14	102
1917 . . . . .	26.69	21.90	96.77	49	9	0	0	10	25
Means . . . . .	21.91	17.46	—	—	—	—	1	6	23

*Oat Crops.*—Quite a large assortment of varieties of oats were grown this year, but conditions were so bad that the returns obtained are no criterion of what these varieties will do in the district. Field No. 2 carried Calcutta oats, most of which was cut for hay, but about 4½ acres were left and harvested for grain. In No. 16 all of the other varieties were grown. The field was not cropped in 1916, but carried as its last crop wheat in 1915. It was ploughed in August and September, cultivated and harrowed in October, cultivated in December, and again at seeding; finally it was harrowed before and after the drill. The varieties were drilled in from June 9th to 16th, using 60lbs. of seed and 1cwt. superphosphate to the acre. Germination of all varieties was good, but the wet was too much for any of them to produce much grain. The yields obtained from the oat varieties will be found below:—

*Oat Variety Yields—Kybybolite, 1917.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Calcutta . . . . .	2	4.20	64 16	15 18
Calcutta, Sel. 1 . . . . .	16	2.73	29 25	10 34
Calcutta, Sel. 4 . . . . .	16	1.39	8 35	6 15
White Liggowo, Sel. 4 . . . . .	16	1.03	6 4	5 37
Clydesdale, Sel. 4 . . . . .	16	1.35	7 29	5 29
Burpee Welcome . . . . .	16	0.39	2 9	5 28
Clydesdale, Sel. 3 . . . . .	16	0.46	2 14	5 4
Dillon . . . . .	16	0.05	0 9	4 20
Goldfinder, Sel. 3 . . . . .	16	0.16	0 27	4 9
Golden Rain . . . . .	16	0.18	0 27	3 30
White Liggowo, Sel. 3 . . . . .	16	0.16	0 24	3 30
Algerian, Sel. 4 . . . . .	16	0.97	3 5	3 9
Royal Cluster, Sel. 4 . . . . .	16	0.35	1 1	2 37
Algerian Tartar, Sel. 4 . . . . .	16	0.60	1 20	2 20
Algerian Tartar, Sel. 3 . . . . .	16	0.17	0 17	2 20
Ruakura . . . . .	16	0.18	0 18	2 20
Royal Cluster . . . . .	16	0.18	0 17	2 14
Conqueror . . . . .	16	0.29	0 24	2 3
Goldfinder . . . . .	16	0.23	0 18	1 38
Sunrise . . . . .	16	0.52	0 37	1 31
Algerian (Exp.) . . . . .	—	5.07	21 37	4 13
Farm average . . . . .	—	20.66	154 13	7 19

The farm average shown is, by a good deal, lower than has been received at this farm since 1910, as can be seen in the next table:—

*Oat Returns, Kybybolite, 1910-1917.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield. Bush. lbs.		Yield per Acre. Bush. lbs.	
	In.	In.					
1910 .. .. .	28.35	21.08	77.00	1,001	0	13	0
1911 .. .. .	22.23	14.72	60.91	828	13	13	24
1912 .. .. .	20.83	18.23	103.00	3,450	36	33	20
1913 .. .. .	18.44	13.98	94.55	1,460	10	15	18
1914 .. .. .	11.94	8.43	6.00	61	3	10	7
1915 .. .. .	23.30	21.18	79.74	1,251	25	15	28
1916 .. .. .	23.53	20.19	61.94	1,388	39	22	17
1917 .. .. .	26.69	21.90	20.66	154	13	7	19
Means .. .. .	21.91	17.46	—	—	—	16	17

*Barley Crops.*—Barley has always been a very disappointing crop at this farm, so that the very low return disclosed is to be expected in such a bad year, particularly as most of the barley was grown in fields reseeded because other crops had failed, and some was not put in the ground until October 3rd. Three varieties—Short Head, Duckbill, and Prior—were sown on June 18th in Field No. 16, using 80lbs. seed and 1cwt. superphosphate to the acre, but all the remainder was late-sown to reseed fields. Field No. 12 had beans and pease in 1916, was ploughed up in May and June, and immediately sown to wheats (May 25th to 31st and June 1st). Some of these did not germinate, so portion of the field was again sown to wheat with a like result. The land was reploughed on August 29th, and on September 14th and 15th was seeded to Cape barley, at the rate of 100lbs. seed to the acre. Field No. 20B was seeded to wheat from June 1st to 13th, but part of it failed to germinate, so was resown to Cape barley on September 14th and 15th, at 100lbs. seed per acre. Field No. 18 went through much the same treatment. It was sown to wheats and ryes during the latter part of June, all of which failed to germinate, and so Cape barley was drilled in on August 15th and 16th. The barley failed like the wheats and ryes, so the whole field was ripped up and again sown with Cape barley from September 27th to October 3rd. The yields obtained are set out below:—

*Barley Variety Yields—Kybybolite, 1917.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield. Bush. lb.		Yield per Acre. Bush. lbs.	
Cape .. .. .	12	7.81	53	23	6	50
Cape .. .. .	20B	4.93	27	14	5	27
Short Head, Sel. 4. .. .. .	16	1.98	9	49	5	2
Cape .. .. .	18	49.95	208	42	4	9
Prior, Sel. 4 .. .. .	16	0.65	2	5	3	12
Duckbill, Sel. 4 .. .. .	16	0.99	3	8	3	10
Farm average .. .. .	—	66.31	304	41	4	30



Although the average for the farm is but 4bush. 30lbs., it only brought the mean yield since 1910 down to 12bush. 27lbs. from 13bush. 31lbs. The next table shows the barley returns since 1910:—

*Barley Returns, Kybybolite, 1910-1917.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre. Bush. lbs.
	In.	In.		Bush.	lbs.	
1910 . . . . .	28.35	21.08	45.39	299	29	6 30
1911 . . . . .	22.23	14.72	58.76	552	16	9 20
1912 . . . . .	20.83	18.23	50.00	1,500	0	30 0
1913 . . . . .	18.44	13.93	35.00	527	0	15 3
1914 . . . . .	11.94	8.43	3.02	37	48	12 29
1915 . . . . .	23.30	21.18	50.28	789	39	15 35
1916 . . . . .	23.53	20.19	43.24	273	37	6 17
1917 . . . . .	26.69	21.90	66.31	304	41	4 30
Means . . . . .	21.91	17.46	—	—	—	12 27

*Rye Crops.*—About 20 acres were sown to varieties of rye in Field No. 18, but in all cases proved an absolute failure. The behaviour of this cereal at the farm since 1914 is set out below:—

*Rye Returns, Kybybolite, 1915-1917.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre. Bush. lbs.
	In.	In.		Bush.	lbs.	
1914 . . . . .	11.94	8.43	6.00	90	16	15 3
1915 . . . . .	23.30	21.18	7.27	57	44	7 45
1916 . . . . .	23.53	20.19	8.20	35	3	4 14
1917 . . . . .	26.69	21.90	—	—	—	Failure
Means . . . . .	21.36	17.92	—	—	—	6 46

*Wheat Crops.*—The usual more or less large collection of wheat varieties was again grown at the farm, but with rather disastrous results this season, as the highest yield obtained from the best variety was but 5bush. 29lbs. Field No. 11 carried a crop of buckwheat in 1916, was ploughed on June 7th and 8th, and sown to wheat on June 8th, using 80lbs. seed and 1cwt. superphosphate to the acre. Field No. 12 had crops of beans and pease in 1916, was ploughed from May 23rd to June 30th, and was seeded to varieties of wheat as ploughed. Some of the wheats germinated well enough, but the wetness and the presence of sorrel killed all chances of getting good returns. Field No. 16 was out of crop in 1916, and was fallowed in August and September, and was worked well throughout year, being in good order at seeding. Part of the field was seeded to wheat from June 9th to 19th at the rate of 80lbs., with 1cwt. superphosphate to the acre. Germination was good, but wetness kept down yields. Field No. 20a was fallowed between August 25th and September 6th, and about 10 acres of the 90 acres contained in the field were sown to sorghum in the spring, which part was ploughed on April 6th and 7th. Wheat varieties were drilled

in from June 1st to 13th at the rate of 80lbs. seed with 1cwt super-phosphate to the acre. Part of the crops failed to germinate, and were resown to barley, and what was left to make wheat crops was very thin and patchy. The yields obtained from the varieties of wheats grown in the above fields are to be seen set out below:—

*Wheat Variety Yields, Kybybolite, 1917.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Federation, Sel. 3 . . . . .	11	0.61	3 21	5 29
Russian White . . . . .	16	0.69	3 45	5 26
Zealand Blue, Sel. 3 . . . . .	20a	4.09	20 29	5 0
White Essex, Sel. 3 . . . . .	20a	6.71	32 29	4 50
White Tuscan, Sel. 3 . . . . .	20a	7.41	35 11	4 45
Queen Fan, Sel. 4 . . . . .	11	1.38	5 18	3 50
Davies . . . . .	20a	0.30	1 7	3 43
Zealand Blue . . . . .	20a	1.69	6 12	3 40
Zealand Blue, Sel. 4 . . . . .	20a	0.99	3 17	3 19
Queen Fan, Sel. 3 . . . . .	11	1.18	3 50	3 15
Federation, Sel. 4 . . . . .	11	1.87	5 58	3 11
Marshall's No. 3, Sel. 1 . . . . .	12	4.22	13 3	3 6
Lott's, Sel. 4 . . . . .	16	1.13	3 22	2 59
Bordier, Sel. 4 . . . . .	16	1.72	5 4	2 57
Yandilla King, Sel. 1 . . . . .	12	4.38	12 33	2 52
Yandilla King, Sel. 3 . . . . .	20a	2.83	7 59	2 49
Marshall's No. 3, Sel. 3 . . . . .	16	1.61	4 6	2 33
Yandilla King, Sel. 4 . . . . .	16	2.10	5 14	2 30
White Essex, Sel. 1 . . . . .	12	7.79	19 18	2 29
Golden Chaff . . . . .	12	4.28	9 38	2 15
White Essex, Sel. 4 . . . . .	16	1.38	2 27	1 47
White Tuscan, Sel. 4 . . . . .	16	1.12	1 45	1 34
Marquis . . . . .	16a	3.70	4 45	1 17
Marshall's No. 3, Sel. 4 . . . . .	16	0.75	0 36	0 48
Queen Fan (Exp.) . . . . .	—	6.53	20 42	3 10
Farm average . . . . .	—	70.46	231 29	3 26

The average yield disclosed is exceptionally low, being practically 2bush. below that of 1910, another exceptionally wet year with badly distributed rainfall. Below will be found the returns for each year since 1910, with the mean for the period:—

*Wheat Returns, Kybybolite, 1910-1917.*

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1910 . . . . .	23.35	21.08	15.00	79 43	5 19
1911 . . . . .	22.23	14.72	17.15	232 45	13 34
1912 . . . . .	20.83	18.23	81.91	1,876 35	22 54
1913 . . . . .	18.44	13.93	48.20	1,288 56	26 44
1914 . . . . .	11.94	8.43	22.17	238 32	10 46
1915 . . . . .	23 30	21.18	79.64	882 31	11 5
1916 . . . . .	23.53	20.19	98.75	1,875 19	18 59
1917 . . . . .	26.69	21.90	70.46	231 29	3 26
Means . . . . .	21.91	17.46	—	—	14 6

As many varieties have been grown continuously at this farm for some time now their behaviour is of interest, and can be seen below:—

*Yields of Wheat Varieties, Kybybolite, 1912-1917.*

	1912.	1913.	1914.	1915.	1916.	1917.	Means, 1912- 1917.	Means 1914 1917.
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
White Tuscan ....	25 20	31 25	18 6	11 16	24 5	4 20	19 5	14 27
White Essex.....	27 32	24 41	21 49	9 17	20 48	3 25	17 55	13 50
Federation .....	33 29	23 16	12 30	12 13	20 25	3 35	17 36	12 13
Yandilla King ...	28 16	30 47	Failure	6 13	27 2	2 46	15 51	9 0
Marshall's No. 3 ...	24 45	29 33	Failure	8 47	21 30	2 42	14 33	8 15
Lott's .....	30 20	31 33	Failure	3 53	17 7	2 59	14 19	6 0
Bordier .....	25 34	25 21	Failure	8 28	16 32	2 57	13 9	6 59
Queen Fan .....	—	—	18 43	17 43	21 10	3 17	—	15 13
Zealand Blue .....	—	—	1 4	6 52	26 54	4 26	—	9 49
Golden Chaff .....	—	—	—	10 6	31 10	2 15	—	—
Marquis.....	—	—	—	11 10	26 13	1 17	—	—
Russian White .....	—	—	—	2 55	21 10	5 26	—	—
Farm average ....	22 54	26 44	10 46	11 5	18 59	3 26	15 39	11 4
	In.	In.	In.	In.	In.	In.	In.	In.
Total rainfall ....	20-83	18-44	11-94	23-30	23-53	26-69	20-79	21-39
"Useful" rainfall .	18-23	13-93	8-43	21-18	20-19	21-90	17-31	17-92

MISCELLANEOUS CROPPING.

Many crops besides the cereals are always tried at this farm, and although so much trouble was met with during seeding operations through delays caused by wet weather and having to reseed so much that was drowned out, this practice was continued.

*Pease.*—This crop has always been fairly successful at the farm, and this season about 23 acres of Early Dun and 17 acres of Egyptian pease were drilled in in Field No. 17. This field was very wet, and teams could not be got on to it, with the result that the crop was not seeded until October 17th to 19th. As was expected this seeding was much too late, and the crop had too short a period in which to make enough growth to produce returns of grain. This being so the crop was not left for grain, but was fed off by livestock, and gave a fair amount of useful feed.

*Beans.*—For the second time, Tick beans were tried, but conditions did not allow of the seed being put in until October 11th. The crop did not have time to develop grain, so was fed off by livestock.

*Vetches.*—For the first time vetches were tried in the field, but like the other leguminous crops, could not be sown until October 16th. The germination was good, and despite the late seeding the growth was very fair, providing quite a lot of good fodder.

*Linseed.*—A small block of linseed was again tried, and was sown in September in Field No. 16A. No germination resulted from this seeding, but as the seed was of our own growing it may have been as much the cause of non-germination as the very wet conditions obtaining at the time of seeding.

*Kale.*—Fields Nos. 20 and 20A, containing about 25 acres, were sown to Thousand Headed kale on November 1st and 2nd. This crop is the one crop that has never failed us at Kybybolite, and has given us really good crops in the driest as well as the wettest years that we have experienced at the farm. The performance was again repeated this year by producing a good stand that is making rapid growth.

*Canary Grass.*—For the first time this crop was tested to produce seed, and was sown in September in Field No. 16A. The germination was really good, but the plants made but short growth, and did not produce much seed.

*Silver Beet.*—Field No. 10 was to have been sown with this crop in the autumn, but could not be ploughed until April 9th, because it was so hard. Seed was drilled in on April 14th to 16th, but the land was too dry for germination. When rains came the seed responded well, but the cold weather set in immediately and the plants quickly died out. The field was reseeded on October 17th at 4lbs. to the acre, and a fair crop has resulted.

*Summer Crops.*—The usual collection of summer crops were again tried—Maize, sorghum, millet, Sudan grass, turnips, swedes, silver beet, and mangels. Of these the maize and mangels were complete failures; the sorghum, millet, and Sudan grass germinated fairly well, and produced some feed; but the turnips and swedes, particularly the former, although not good, were the best of the summer crops. From November on very little rain fell, not nearly enough to give any chance of these crops making much growth.

*Sunflowers.*—Field No. 9A, about three acres, was sown to sunflowers on October 18th in rows about 28in. apart, with the ordinary seed drill, using nearly 5lbs. of seed per acre. These germinated well, and without irrigation of any kind made quite decent growth. As a matter of fact it was the only summer crop that made much growth at all. The crop has not yet been harvested, but returns should be fair.

*Artichokes.*—About a quarter of an acre was planted with Jerusalem artichokes, but the germination was poor, and only odd plants came up.

*Irrigated Maize.*—About three-quarters of an acre was sown with three varieties of maize of about equal area—Hickory King, Horse Tooth, and Yellow Moruya—to be grown under irrigation for grain. These varieties have done well, particularly the Horse Tooth, but have not yet been harvested.

## EXPERIMENTAL PLOTS.

In 1912 a set of permanent experimental plots was laid down, and since that time three further series have been commenced. Details of the results from these plots will be found in the tables following.

*Permanent Cultivation Plots with Oats, Kybybolite.*

These plots, set out to discover the advantages, if any, of bare fallow, the time to plough, the time to cultivate, and the number of times to cultivate, were surveyed and cultivated in 1912, and carried their first crops in 1913, so that with this season we now have the results of four years. The table below shows the averages of the results obtained over the whole period, 1913-1917, for grain, and since 1914 for the total produce:—

*Permanent Cultivation Plots with Oats at Kybybolite.—Means of Results for Period, 1913-1917.*

1ewt. superphosphate to the acre used each year.

Plots.	Treatment.	Total Produce.			Grain per Acre. Bush./A.
		T.	C.	L.	
2 & 3	Alternate cropping, without fallow . . . . .	0	16	86	15 29
4 & 5	Autumn ploughed . . . . .	†1	0	48	*20 33
6 & 7	Autumn ploughed, spring cultivated . . . . .	0	16	102	18 31
8 & 9	Autumn ploughed, spring cultivated, summer cultivated . . . . .	0	15	78	19 33
10 & 11	Winter ploughed . . . . .	0	18	89	19 35
12 & 13	Winter ploughed, spring cultivated . . . . .	1	0	18	21 24
14 & 15	Winter ploughed, spring cultivated, summer cultivated . . . . .	0	19	107	23 33
16 & 17	Spring ploughed . . . . .	0	19	59	19 18
18 & 19	Spring ploughed, spring cultivated . . . . .	0	19	88	25 6
20 & 21	Spring ploughed, spring cultivated, summer cultivated . . . . .	1	4	82	25 32
22 & 23	Summer ploughed . . . . .	0	16	61	19 13
24 & 25	Summer ploughed, summer cultivated . . . . .	0	14	64	15 23
26	Annual cropping . . . . .	0	13	69	14 23

\* 4 years only. † 3 years only.

*Ploughing.*—Autumn, April-May; Winter, June-July; Spring, September; Summer, November.

*Cultivation.*—Spring, September, October; Summer, November.

The above table hardly shows the effects of the various cultivations in the various seasons, but the next two tables will illustrate these in detail.

*Details of Grain Yields from Kybybolite Permanent Cultivation  
Plots with Oats, 1913-1917.*

Plots.	1913.	1914.	1915.	1916.	1917.	Means.
	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
2 & 3 .....	26 37	8 31	9 25	27 13	5 28	15 27
4 & 5 .....	23 37	—	22 38	32 16	4 2	*20 33
6 & 7 .....	28 0	10 18	22 39	29 28	2 30	18 31
8 & 9 .....	33 1	10 18	22 28	30 26	2 10	19 33
10 & 11 .....	32 34	9 16	22 25	31 12	3 8	19 35
12 & 13 .....	39 11	10 4	24 1	32 20	2 2	21 24
14 & 15 .....	46 29	13 18	23 37	33 7	1 34	23 33
16 & 17 .....	35 18	8 24	19 10	30 37	3 3	19 18
18 & 19 .....	53 5	12 27	23 7	32 31	3 39	25 6
20 & 21 .....	48 8	17 0	21 10	33 14	9 7	25 32
22 & 23 .....	37 26	10 13	16 2	25 37	6 29	19 13
24 & 25 .....	33 21	8 11	9 13	22 29	4 25	15 28
26 .....	32 30	2 27	1 34	28 31	6 32	14 23
Farm average for oats	15 18	10 7	15 28	22 17	7 19	14 10
Total rainfall .....	18.44in.	11.94in.	23.30in.	23.53in.	26.69in.	20.78in.
"Useful" rainfall ...	13.93in.	8.43in.	21.18in.	20.19in.	21.90in.	17.13in.

\* Four years only.

Algerian oats used each year.

*Details of Total Produce Yields from Kybybolite Permanent  
Cultivation Plots with Oats, 1914-1917.*

Plots.	1914.			1915.			1916.			1917.			Means.		
	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.
2 & 3 .....	0	10	0	0	17	75	1	9	15	0	10	29	0	16	86
4 & 5 .....	—	—	—	1	0	58	1	13	9	0	7	78	†1	0	48
6 & 7 .....	0	9	81	1	0	11	1	11	47	0	6	46	0	16	102
8 & 9 .....	0	10	0	0	19	86	1	7	102	0	5	14	0	15	78
10 & 11 .....	0	8	37	1	6	104	1	14	88	0	5	14	0	18	89
12 & 13 .....	0	9	52	1	6	2	2	1	36	0	3	95	1	0	18
14 & 15 .....	0	12	25	1	1	90	2	3	26	0	2	63	0	19	107
16 & 17 .....	0	7	87	1	3	17	2	2	7	0	5	14	0	19	59
18 & 19 .....	0	10	62	0	16	52	2	7	1	0	5	14	0	19	88
20 & 21 .....	0	13	100	1	2	80	2	10	110	0	11	60	1	4	82
22 & 23 .....	0	7	87	1	1	39	1	9	41	0	7	78	0	16	61
24 & 25 .....	0	6	75	0	13	26	1	8	87	0	9	69	0	14	64
26 .....	0	3	37	0	13	58	1	9	32	0	8	37	0	13	69
Farm average for															
hay .....	0	16	59	1	0	65	1	14	102	0	10	25	1	0	63
Total rainfall ....		11.94in.			23.30in.			23.53in.			26.69in.			21.36in.	
"Useful" rainfall ...		8.43in.			21.18in.			20.19in.			21.90in.			17.92in.	

† Three years only.

On the means of the four years there is nothing to make necessary any alteration in the conclusions drawn last year, viz.:-

(1) That some form of fallowing is necessary, for the alternate cropping without fallow (plots 2-3) is very little better than the annual cropping (plot 26).

(2) That when summer ploughed the land is better left until seeding operations rather than be stirred up soon after the ploughing (plots 22-25).

(3) That spring ploughing, providing cultivation follows, is a little better than any other form of treatment (plots 18-21).

(4) That land ploughed in the winter needs much after cultivation, and is the only time when summer cultivation is of much advantage (plots 14-15).

(5) That autumn ploughing does not give results equal to winter and spring ploughing, nor is it indeed much better than the summer ploughing alone (plots 4-9 and 22-23).

These results seem to hinge largely on the fact that these particular soils break down very finely at every cultivation, and when the rains come they set like a brick. This would certainly help to account for the failure of autumn ploughing, and is possibly the cause of the depressing effect of summer cultivation applied when the land has been ploughed in the spring and in the summer.

#### PERMANENT DEPTH OF PLOUGHING PLOTS, KYBYBOLITE.

This series of experimental plots was laid down in 1914, and then ploughed and cultivated for the first time, so they have to date carried two crops of wheat. The plots have as their object the testing of the value of various depths of ploughing done at different times of the year, and also the effects of varying the depth at which the land is ploughed. For the years 1915 to 1917 these plots have behaved as is set out in the following two tables, one showing grain yields and the other the total produce results:—

*Kybybolite Permanent Depth of Ploughing Plots with Wheat. Grain per Acre, 1915-1917.*

Plots.	Depth of Ploughing.	1915.	1916.	1917.	Means
		Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
1 & 1A	3in. in winter	7 51	9 19	4 3	7 4
2 & 2A	4½in. in winter	9 18	15 8	5 2	9 40
3 & 3A	6in. in winter	11 43	17 12	4 42	11 12
4 & 4A	7½in. in winter	10 53	18 20	2 56	10 43
5 & 5A	9in. in winter	12 37	17 22	3 38	11 12
6 & 6A	3in. in spring	11 22	11 48	4 52	9 21
7 & 7A	4½in. in spring	10 2	16 28	2 35	9 42
8 & 8A	6in. in spring	10 59	20 33	2 69	11 30
9 & 9A	7½in. in spring	13 48	21 49	3 49	13 9
10 & 10A	9in. in spring	14 49	23 15	3 56	14 0
11 & 11A	3in. in autumn at seeding	14 37	20 3	1 56	12 12
12 & 12A	4½in. in autumn at seeding	13 19	21 59	1 17	12 12
13 & 13A	6in. in autumn at seeding	15 22	23 13	2 35	13 43
14 & 14A	7½in. in autumn at seeding	13 18	24 45	1 10	13 4
15 & 15A	9in. in autumn at seeding	17 37	21 58	1 53	13 49
16 & 16A	4½in. in spring { Deeply ploughed	11 2	26 15	2 14	13 10
17 & 17A	7½in. in spring { every second fallow	13 10	23 24	2 14	12 56
18 & 18A	4½in. in spring { Deeply ploughed	12 54	23 13	1 46	12 38
19 & 19A	4½in. in spring { every third fallow	15 47	23 52	2 28	14 2
20 & 20A	7½in. in spring { every fourth fallow	16 33	21 51	1 56	13 27
21 & 21A	4½in. in spring { Deeply ploughed	16 41	23 8	2 45	14 11
22 & 22A	4½in. in spring { every fourth fallow	13 31	29 5	3 3	15 13
23 & 23A	4½in. in spring { every fourth fallow	12 30	29 43	4 31	15 35
24 & 24A	7½in. in spring { every fourth fallow	10 26	28 50	4 31	14 36
		11 5	18 59	3 26	11 10
	Farm wheat average			26 69in.	24 51in.
	Total rainfall	23.30in.	23.53in.	21.90in.	21.09in.
	"Useful" rainfall	21.18in.	20.19in.		

*Kybybolite Permanent Depth of Ploughing Plots with Wheat.—Total Produce per Acre, 1915-1917.*

Plots.	Depth of Ploughing.	1915.			1916.			1917.			Means.		
		T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.
1 & 1A	3in. in winter	0	13	35	0	14	91	0	7	103	0	12	2
2 & 2A	4½in. in winter	0	12	46	0	19	109	0	8	90	0	13	82
3 & 3A	6in. in winter	0	15	57	1	7	14	0	8	90	0	17	16
4 & 4A	7½in. in winter	0	18	68	1	9	32	0	5	32	0	17	81
5 & 5A	9in. in winter	1	0	76	1	4	57	0	6	18	0	17	13
6 & 6A	3in. in spring	0	10	38	0	16	56	0	9	76	0	12	19
7 & 7A	4½in. in spring	0	15	40	1	9	5	0	5	32	0	16	63
8 & 8A	6in. in spring	0	15	40	1	8	79	0	5	32	0	16	50
9 & 9A	7½in. in spring	0	12	19	1	12	10	0	6	18	0	16	90
10 & 10A	9in. in spring	1	1	80	1	12	82	0	6	18	1	0	23
11 & 11A	3in. in autumn at seeding	0	17	46	1	7	56	0	3	58	0	16	16
12 & 12A	4½in. in autumn at seeding	0	12	32	1	10	26	0	2	72	0	15	6
13 & 13A	6in. in autumn at seeding	1	0	76	1	16	12	0	5	32	1	0	77
14 & 14A	7½in. in autumn at seeding	1	0	76	1	15	45	0	2	72	0	19	64
15 & 15A	9in. in autumn at seeding	0	17	46	1	12	6	0	3	58	0	17	74
16 & 16A	4½in. in spring	0	45	57	2	1	17	0	4	45	1	0	40
17 & 17A	7½in. in spring												
	Deeply ploughed every second fallow	0	16	61	1	16	75	0	5	32	0	19	56
18 & 18A	4½in. in spring	0	14	38	1	14	94	0	3	58	0	17	63
19 & 19A	4½in. in spring												
20 & 20A	7½in. in spring												
	Deeply ploughed every third fallow	1	2	84	1	18	32	0	5	32	1	2	12
		1	0	76	1	19	105	0	3	58	1	1	42
21 & 21A	4½in. in spring	0	14	53	1	17	85	0	4	45	0	18	98
22 & 22A	4½in. in spring												
23 & 23A	4½in. in spring												
24 & 24A	7½in. in spring												
	Deeply ploughed every fourth fallow	1	0	76	2	2	19	0	5	32	1	2	80
		0	13	35	2	2	28	0	7	4	1	0	97
		0	9	24	1	15	21	0	12	36	0	18	102
Farm hay average		1	0	65	1	14	102	0	10	25	1	1	101
Total rainfall		23.30in.			23.53in.			26.69in.			24.51in.		
"Uschul" rainfall		21.18in.			20.19in.			21.90in.			21.09in.		

1cwt. superphosphate to the acre used each year.

These plots have been conducted for the past three seasons, and although the period is rather short to hope to make anything like a correct interpretation, still for the period there are a few outstanding results—(1) The differences between the returns from the various depths of ploughing are rather considerable, and are much in favor of the deeper ploughing. This is particularly so when ploughed deeper than 4½in., but to a lesser extent between 6in. ploughing and 9in. ploughing. If any reliance is to be placed on the results they certainly show that at Kybybolite ploughing for wheat should be at least 6in. in depth. (2) In these conditions the land is much better ploughed in spring or autumn, rather than in winter. (3) When ploughed shallow



(4½ in. and 3 in.) the best results are obtained from land ploughed in autumn rather than in spring or winter. These differences are clearly seen in the following table:—

*Influence of Various Depths of Ploughing, Kybybolite, 1916-1917.*

Treatment.	Grain per Acre.		Total Produce per Acre.			Total Produce per Acre.		
	Bush. lbs.	Bush. lbs.	T.	C.	L.	T.	C.	L.
9 in. ploughing—Winter . . . . .	11 12	—	0	17	13	—	—	—
Spring . . . . .	14 0	—	1	0	23	—	—	—
Autumn . . . . .	13 49	—	0	17	74	—	—	—
Means . . . . .	—	13 0	—	—	—	0 18	37	—
7½ in. ploughing—Winter . . . . .	10 43	—	0	17	81	—	—	—
Spring . . . . .	13 9	—	0	16	90	—	—	—
Autumn . . . . .	13 4	—	0	19	64	—	—	—
Means . . . . .	—	12 19	—	—	—	0 17	78	—
6 in. ploughing—Winter . . . . .	11 12	—	0	17	16	—	—	—
Spring . . . . .	11 30	—	0	16	50	—	—	—
Autumn . . . . .	13 43	—	1	0	77	—	—	—
Means . . . . .	—	12 8	—	—	—	0 18	10	—
4½ in. ploughing—Winter . . . . .	9 49	—	0	13	82	—	—	—
Spring . . . . .	9 42	—	0	16	63	—	—	—
Autumn . . . . .	12 12	—	0	15	6	—	—	—
Means . . . . .	—	10 34	—	—	—	0 15	13	—
3 in. ploughing—Winter . . . . .	7 4	—	0	12	2	—	—	—
Spring . . . . .	9 21	—	0	12	19	—	—	—
Autumn . . . . .	12 12	—	0	16	16	—	—	—
Means . . . . .	—	9 32	—	—	—	0 13	50	—

PERMANENT MANURIAL PLOTS WITH WHEAT AND WITH OATS.

Both of these series of experimental plots were seeded this year, but the germination of both was an absolute failure. The wheat plots were resown without success, but the oat plots remained too wet to be able to get a team of horses on to the land.

TEMPORARY FIELD EXPERIMENTS.

The whole season was too extraordinary to hope to get results from any tests conducted, but still results must be kept as records of what did happen. Contrary to most of our experiments, some lime tests gave very marked results, but as the tests were conducted on fairly large areas, irregularities were more or less counteracted. In these tests two different quantities of lime were applied to parts of a field between ploughing and seeding, and the remainder of the field left unlimed. Other than these lime dressings the whole field was treated in the same manner.

*Liming Test with Algerian Oats for Hay, Kybybolite, 1917.*

Application per Acre.	Area. Acres.	Total Yield.			Yield per Acre.		
		T.	C.	L.	T.	C.	L.
16cwt. lime . . . . .	15.01	9	18	0	0	13	21
10cwt. lime . . . . .	14.54	8	5	56	0	11	43
Unlimed . . . . .	33.66	12	1	56	0	7	20
Farm average for hay . . . . .	—	—	—	—	0	10	25

## GENERAL.

Where Italian rye grass and Perennial red clover were sown with hay crops in 1915 much valuable feed was obtained from these two fodders during this year. Their success was such that we are quite prepared to extend the area to be put under them, and it appears that much of the "wet" land of the estate can be made to carry much more stock by utilising these plants.

The effects of dressings of lime on various parts of the farm are becoming very apparent, particularly as to the checking of sorrel. This year, when sorrel was exceptionally bad, the only parts of the farm free from the pest were those that had been limed in 1916 or before. In the year of application lime has practically no effect on sorrel, whereas in the second year, and more so in the third year after application, the amount of this plant pest present is very small.

---

"GOOSEFOOT."

A specimen of *Chenopodium album*, popularly known as the "Goose-foot," was recently received from a correspondent in the Pinnaroo district, who states that the plant was readily eaten by pigs, cows, and horses. Professor Osborn, to whom the plant was submitted for identification, states that it is an alien from Europe. In the opinion of the Superintendent of Experimental Work (Mr. W. J. Spafford), "Goose-foot" is a nuisance as a weed in crops that are cultivated in rows, particularly in loose open soils, but it is not a trouble in cereal crops. In the Pinnaroo district it will very possibly be found to be a useful fodder plant, growing strongly in good years, at all events, in the odd corners of light sandy land left out of crop.

---

SHEEP DOGS AND FLEAS.

"It is most difficult to get rid of fleas from outdoor dogs, as they breed in their sleeping places. It is necessary to burn bags, &c., on which they lie, and to burn straw on the ground if there are no bags," says the Veterinary Lecturer. "Then stand the dog on a newspaper and powder from top to toe with insectibane or similar powder, after some minutes brushing out the half-dead fleas and burning them in the paper. This must be done once or twice a week. Every day wipe the dog lightly with the following mixture, especially about ears and neck:—Eucalyptus oil, 1 part; methylated spirit, 10 parts; olive oil, 9 parts. The animal may be given an occasional bath in sheep dip, but not double strength, as this causes much irritation of the skin, and I suspect may be partly responsible for the mangy appearance of the dogs mentioned by a correspondent who sought information on this subject."

## THE GROWING OF LUCERN.

[An address delivered before the Conference of Mid-Northern Branches of the Agricultural Bureau by the Director of Agriculture, Professor ARTHUR J. PERKINS.]

### HISTORICAL.

Lucern is one of the oldest cultivated forage crops of the warmer countries of the world, and we find due appreciation of it from the earliest times. It appears to have been brought from Asia by the Greeks during the course of their Persian wars, towards 470 B.C., and it is from this fact that the genus to which lucern belongs—*Medicago*—derives its name, namely, in connection with Media. Subsequently, from Greece, the Romans appear to have introduced it into Italy, whence we find it very highly spoken of by the early Roman agricultural writers.

In our days, lucern may be said to have spread all over the globe; it is, however, chiefly in the warmer countries such as those bordering on the Mediterranean, the Southern States of the United States of America, South America, &c., that lucern has found its chief sphere of usefulness. Lucern is also deservedly popular in the various Australian States; its use, however, is almost entirely restricted to irrigation conditions.

### LUCERN INSUFFICIENTLY APPRECIATED IN SOUTH AUSTRALIA.

I am afraid that it cannot be said that we in South Australia have hitherto taken full advantage of lucern as a forage crop; nor is it perhaps difficult to account for this neglect. As farmers, we have not yet interested ourselves sufficiently in livestock operations; and those of us who have taken up livestock, have for the most part failed to realise that success with livestock, handled on relatively small areas, is dependent mainly on the special provisions that are made for feeding them. In other words, farmers who have taken up livestock have not always recognised that station practices cannot safely be applied to farms. We cannot, it is true, very well escape making special provision for the feeding of our working horses; if the bulk of their time is taken up in work, we can hardly expect them to roam the fields for their upkeep. The same necessity does not appear to hold good for cattle and sheep; and however great the distances to be covered, we are inclined to let them walk about for their meals. Undoubtedly,

this practice is economically sound, so long as the grazing at our disposal is amply equal to all demands; which should be the case on a station, but is never so on a farm. On the other hand, it is comparatively easy to walk condition and milk off grazing livestock. I believe that ultimately it will come to be recognised that if our farms are ever to be stocked up to their full capacity, "grazing" must be looked upon as no more than a useful aid to ordinary feeding operations. In principle, we shall have to admit that livestock farming consists essentially in the transformation into flesh, milk, wool, or power, of produce raised on the farm, assisted by natural grazing, and such outside help as may be necessary.

When we realise the force of these principles, and particularly when we are prepared to put them into practice, there will, in my opinion, be considerably more lucern grown in South Australia than is the case at the present moment.

#### LUCERN USUALLY AN IRRIGATED CROP.

Lucern, we know, makes its chief growth during the summer months; and since, over the bulk of this State, our summers are more or less rainless, this crop shows to best advantage under irrigation. Nevertheless, when circumstances are particularly favorable, lucern can be, and has been, grown satisfactorily without irrigation; in such circumstances, the total yields of green forage or hay are undoubtedly smaller; but, under good management, they are far from unremunerative.

Whenever reference is made to irrigation, our thoughts are apt, very naturally, to turn to our large irrigation settlements; and the average farmer is inclined to think that irrigation is no business of his; and, in the circumstances, that he can have but a very remote interest in lucern-growing. Apart, however, from the fact that lucern can be grown to advantage without irrigation—and this I propose referring to later on—the general farmer's view can only be said to be correct so long as his underground water supply is inadequate to irrigation purposes. Wherever there is a good supply of underground water, it will pay any farmer handsomely to put down a well, purchase an engine or windmill, and provide for a small area of irrigated lucern, were it only over an acre or so.

#### SPECIAL VALUE OF LUCERN AS A LIVESTOCK FOODSTUFF.

It is important that we should realise that lucern has a special food-stuff value that places it, in certain circumstances, well ahead of the ordinary forage crops we are accustomed to provide for our livestock. Its chief claim on us in this connection is its richness in "protein"; hence, under our warmer latitudes, it is able, very adequately, to take

the place of the clover hay of cooler countries. I should, perhaps, add that this "protein," in adequate proportions, is an essential ingredient of all good feeding rations; essential to the development of power and the production of milk particularly, but also to the manufacture of flesh, and to the general requirements of young growing animals. Bran is a foodstuff rich in "protein," of which we make frequent use in the feeding of milch cows and young growing animals.

Roughly speaking, bran contains about 13 per cent. of digestible "protein," i.e., 13lbs. of "protein" in 100lbs. of bran, whilst lucern hay contains about 12 per cent., or nearly as much as bran. Wheaten hay, on the other hand, when cut in the early dough state, contains no more than 2.8 per cent. of "protein," as against 3.2 per cent. in green lucern.

It follows from these facts that lucern, whether as hay or as green forage, represents a livestock foodstuff of considerable value; it enables us to raise on our own farms, without much expense, one of the most expensive elements in our ordinary foodstuffs.

#### GENERAL ADAPTABILITY OF LUCERN TO SOILS.

We often hear certain types of country referred to specially as "lucern land"; particularly is this the case in some parts of the Lower North. I am afraid that assertions of this kind have, in the past, been very largely responsible for checking the spread of lucern as a general farm crop. As a matter of fact, there are very few soils indeed on which lucern is not likely to thrive; although one must admit that the total yields of this crop are more satisfactory in some soils than in others.

On the whole, so far as lucern is concerned, the subsoil is probably of greater importance than the soil. Lucern is an exceedingly deep-rooted plant; its roots have at times been traced to depths of 16ft. to 18ft. below the surface. We may take it, therefore, that once established, lucern lives chiefly in the subsoil; hence, a favorable subsoil is of even greater importance than a favorable soil. The best type of subsoil is a good red clay, tolerably rich in lime, so as to be friable, open, and of good natural drainage. A stiff subsoil, exposed to lying wet over a long period of time, is always to be avoided; and the same may be said of a rocky unfissured subsoil. In other words, therefore, lucern requires a type of subsoil into which its long roots are able to penetrate without difficulty.

We cannot, however, altogether overlook the quality and character of the surface soil, since consistently heavy yields are obtainable only when comparatively fertile surface soil of good depth covers a favorable subsoil. In this connection, rich alluvial lands are undoubtedly the

best, and should always be selected when available. I must again insist that for the healthy development of lucern, the presence of a sufficiency of lime in soil and subsoil, is an essential factor.

An underground watertable, relatively close to the surface, is often pointed to as a desirable factor in lucern land. Whilst the value of this feature may be admitted in a general way, it is as well to point out that in certain circumstances it may not be without disadvantage. If, for instance, in these circumstances the height of the watertable is liable to vary with the season, and particularly to rise unduly in the winter months, it may prove more or less fatal to the lucern plants. It cannot therefore be insisted upon too strongly that whatever the character of the soil, it is absolutely essential to the success of lucern that the soil offer good natural drainage facilities, and that the plants be not exposed for any length of time to stagnant moisture.

Finally, it is inadvisable to place lucern on land in which salt is likely to accumulate to any extent under the influence of irrigation operations.

#### PREPARATION OF THE LAND.

When we set about preparing land for lucern, we should always bear in mind that we are about to sow a crop which, we hope, will occupy the land for several successive years; hence, commonsense indicates that we should give to this preparation of the land at least as much attention and care as would be bestowed upon a crop which is sown and reaped and finally disposed of in a single season.

The fact that lucern is a very deep-rooted plant suggests that in preparing the land we should do everything towards facilitating the early descent of the roots into the subsoil; hence, for best possible results, land which is to carry lucern should, from the outset, be subsoiled to a depth of 12in. to 15in. at least. The simplest plan for the purpose is, perhaps, to break up the land with an ordinary plough to a depth of, say, 6in. to 8in., and immediately afterwards follow this work up with a subsoiler, which will stir up the subsoil to the requisite depth without, however, bringing it to the surface.

We must assume this subsoiling to take place at the time of the year best suited for work of this kind, probably in May or June in most districts. Subsequently to this first treatment, land which is to carry lucern must be treated in exactly the same fashion as we should treat bare fallow intended for wheat in the following season. If this practice is carefully followed, the subsoil and the land generally, which have been roughly torn up and opened out to a considerable depth, will, under the influence of winter rains and of successive tillage operations, gradually run together again, and mellow down into a suitable type of

seedbed, the surface of which should be as fine as an onion bed, and the layers immediately below firm and compact, like those of a well-prepared wheat field. Moreover, frequent tillage operations should have the effect of cleaning the land and freeing it from undesirable weeds.

I know that, relatively to what is done for wheat, there is a tendency to slur over the preparation of the land for forage crops; it is well, therefore that we should convince ourselves that both yields and durability of the lucern fields depend very largely on the care and attention we are able to bestow on this initial preparation of the land.

#### THE APPLICATION OF A DRESSING OF FARMYARD MANURE PRIOR TO SEEDING.

It has already been stated that lucern thrives best in naturally fertile land; hence, everything that we can do towards artificially raising the fertility of average land will contribute much towards a general improvement in future yields.

It is often stated that farmyard manure is essentially a nitrogenous manure, and that since the leguminous crops, of which lucern is one, do not draw their nitrogen from the soil but from the atmosphere, they can benefit but little from a dressing of farmyard manure. Nevertheless general experience does not support this view; indeed, quite the contrary would appear to be the case. We may account for the responsiveness of lucern and other leguminous crops to dressings of farmyard manure to the fact that although they do not draw much nitrogen from the soil, for strong, successful growth they are always dependent on an abundance of organic matter, and for soils inadequately provided with the latter, it is always to farmyard manure that the farmer naturally turns. Hence, farmers who, as a rule, have no particular use for farmyard manure in their wheat fields, should distribute it liberally over land which they intend bringing under lucern. Any dressing up to 20 tons to the acre, or over, will not be excessive. This manure should be spread over the ground and ploughed under when the land is first broken up in the way of preparation for lucern; it will thus have a full year to decompose in the soil before seeding operations come round. During this time, too, weeds, the seeds of which it brings with it, will germinate, and can be destroyed by ordinary tillage operations.

#### GRADING OF THE LAND FOR IRRIGATION PURPOSES.

It should be stated here that it is exceedingly unwise to endeavor to grow irrigated lucern on land that has not been carefully graded. If grading is neglected, the usual result is that in a very short space of time

portion of the lucern is liable to die out from excess of water, whilst the balance makes poor, weakly growth because the irrigation waters fail to reach it. If irrigation by flooding is contemplated, the land must be graded to a fairly even level prior to seeding. If, on the other hand, sprinklers are to be availed of, a fall of 3in. in the chain will always be found advantageous from the point of view of drainage.

#### INOCULATION OF SOIL INTENDED TO CARRY LUCERN.

It is to-day a matter of common knowledge that lucern, like other leguminous crops, is able, through the medium of special bacteria living on its roots, to abstract free nitrogen from the atmosphere. Moreover, it has frequently been stated that on land on which lucern has not been grown previously these essential bacteria are at times absent, and that when this is the case, lucern never makes satisfactory growth. So far as my experience goes, this is very rarely the case in South Australia; and we are almost justified in the view that with us, at all events, these special bacteria are more or less ubiquitous. It would appear, however, to be comparatively easy to overcome the difficulty in those cases in which direct experience had shown that these bacteria were absent. All that it would be necessary to do would be to secure suitable quantities of soil from a well-established lucern field in a neighboring district. This soil, which should not be allowed to dry out unduly, should then be drilled over the land immediately prior to seeding at the rate of 2cwts. to 3cwts. to the acre. Hitherto, however, there appears to have been no need for the adoption of this practice in South Australia.

#### SOWING PERIODS FOR LUCERN.

When should lucern be sown? In reply to this question, we find advocates for two seasons, some preferring the spring and others, again, the autumn. Now, whilst I readily recognise that in very cold countries—countries, in fact, in which lucern is not as a rule currently grown—spring sowing has distinct advantages; from the point of view of personal experience, I am convinced that autumn sowing is in every way better adapted to general South Australian conditions. So far as I am able to judge, the only advantage that can be claimed for spring sowing is that the young seedling plants are less exposed to damage by frost than when sown in autumn. Such an advantage unquestionably holds good in those countries in which winter frosts are of exceptional severity. Under our conditions, however, it has, in my opinion, little or no significance; hence, in dealing with seeding operations, I shall assume that we have in view autumn seeding alone.



Moreover, should severe frost happen occasionally to destroy autumn-sown lucern, it always remains open to us to sow again the whole field, or such portions of it as have been damaged, as soon as spring opens.

I think it worth while to draw special attention to one of the chief advantages that can be claimed for autumn sowing of lucern. Autumn sown plants have ample time to penetrate into the depths of the soil before the hot weather sets in; hence, in the summer that immediately follows seeding operations, autumn-sown plants are infinitely stronger and healthier than those sown in spring, and one of the immediate consequences of this fact is that whilst the cuts of the first year from a spring-sown crop are relatively light, the total cuts from an autumn-sown crop of the first year frequently almost equal in weight the cuts of the second year. This, it will be agreed, is, from the pecuniary point of view, a very appreciable advantage in favor of autumn sowing.

Attention should perhaps be drawn to an objection that is frequently raised to autumn sowing. It is said—and with reason—that an autumn-sown crop is very often more or less smothered by winter-growing weeds. I shall point out, in the first place, that this difficulty would be very much minimised if, as I have suggested, the land which is to be sown to lucern had been carefully bare fallowed in the preceding season. Nevertheless, I agree that, in spite of careful fallowing, we cannot altogether avoid the development of a certain amount of winter weed growth. I must state, however, that in my personal experience, these winter weeds are comparatively innocuous from the lucern's point of view; indeed, at times the stronger weeds may even act as shelter against frost to the more slowly growing lucern plants. Let us admit that by August there will often seem to be more weeds than lucern plants. It is wise, at this stage, to take an early cut of lucern and weeds providing always the land is sufficiently dry on the surface to admit of it. Subsequently, under the influence of rising temperatures, the second growth will make rapid progress, and the second cut, still more or less weedy, should follow as soon as possible; in September, if circumstances admit of it. Thereafter, throughout the summer months, I can guarantee that not a weed will be found in a well-sown field of lucern; and this could hardly be said of spring-sown lucern, which in the first year is generally apt to be overrun with strong-growing summer weeds, such as hogweed, &c.

#### THE USES OF A COVERING CROP FOR LUCERN.

The sowing of a sheltering or covering crop simultaneously with lucern is frequently recommended. The chief object aimed at would appear to be to occupy the land more profitably in the first season than

could be done with lucern alone. With this object in view, rye-grass, rye, and even barley or oats are sometimes sown with lucern seed. It cannot be said that this practice is of any particular advantage to the lucern plants themselves; indeed, I am of the opinion that it detracts from the eventual returns of the yield by hindering early growth. When lucern is autumn-sown, I can see absolutely no advantage in adopting this practice; hence, in no circumstances can I recommend it.

#### WHEN TO PRACTISE AUTUMN SOWING.

Assuming that the practice of autumn sowing is recognised as best suited to local conditions, it remains for us to determine what particular time in the autumn months is best adapted to the sowing of lucern.

In principle it is of advantage that the young plants should be above ground as early in autumn as circumstances permit of. In the early autumn the ground is still warm, and given a sufficiency of moisture, the young plants will take very ready advantage of it; hence, if we have irrigation facilities at our disposal, I recommend sowing towards the end of March. If, on the other hand, we have to trust to rain to bring up the seed, we should generally sow on the first break in the season. Should autumn rains hold off unduly, I would not hesitate to sow dry and trust to the first rain to bring up the seed.

#### DRESSING OF SUPERPHOSPHATE PRIOR TO SEEDING.

Notwithstanding an earlier dressing of farmyard manure, it is always advisable, in our type of soils, to drill in from 2cwt. to 4cwt. of superphosphate to the acre immediately prior to seeding.

#### BROADCASTING LUCERN.

The usual practice is to broadcast lucern seed; and for the purpose the small hand broadcasting machines are to be recommended. In order to secure regularity of seeding, it is of course necessary to select a tolerably calm day for the purpose; moreover, the seed should be divided up into two even lots, each of which should be sown over the whole surface, but at right angles to the other. The seed should be broadcasted over a lightly rolled surface, and subsequently rolled in, preferably with a ribbed roller. It is important to remember that lucern seed should never be buried deeply; hence, if a harrow is used for covering purposes, only the very lightest of harrows should be resorted to. In my experience, a ribbed roller is infinitely superior for the purpose to any harrow.

#### QUANTITY OF SEED TO BE SOWN TO THE ACRE.

Opinions differ as to the quantity of lucern seed that should be sown to the acre; some apparently favor light seeding, others heavy seeding.

Personally, I am, from conviction, an advocate of relatively heavy seeding, chiefly because I am satisfied that heavy yields are very largely dependent on a dense stand of plants from the very outset. Hence, when broadcasting lucern, I recommend a seeding of 20lbs. to the acre, 10lbs. sown in one direction, followed by 10lbs. sown at right angles to the first direction. This seeding will appear heavy to many. It should be recollected, however that the best of lucern seed has not a value of much above 88 per cent., if we take into consideration impurities and defective grain. Moreover, when seed is broadcasted, a certain proportion is always lost from the depredations of insects, birds, &c. Briefly, so far as I am concerned, I have never found 20lbs. of seed to the acre too much. I must add, however, that many lucern-growers recommend 12lbs. of seed to the acre as sufficient for all purposes.

#### DRILLING LUCERN.

Broadcasting is not the only method of sowing lucern in use; at times it is drilled. Drilling lucern presents special advantages when the crop is not irrigated. The plants are then set out in rows sufficiently far apart to admit of regular summer tillage between cuts. The usual distance is 18in. to 24in. Naturally, drilling involves the use of far less seed than broadcasting; I believe that 8lbs. to 10lbs. of good seed to the acre should be amply sufficient.

When drilling lucern seed, special precautions should always be taken not to bury the seed too deeply; and with this object in view it is always advisable to drill over a rolled surface. The seed itself should be sown in mixture with bonedust at the rate of 1cwt. to the acre.

#### GOOD SEED CHARACTERISTICS.

Lucern seed is at all times more or less costly; hence it behoves us to see that we are supplied with the best kind of seed procurable. Prior to the war, several types of lucern seed were usually on the market, among others Hunter River seed from New South Wales; Provence seed, usually imported from France; various types of American seed; and, finally, seed of South Australian origin.

Of these different types, Hunter River seed was usually the most popular. Conditionally on the seed chosen being fresh, well developed, and tolerably free from impurities, personally I do not think that there was ever much to choose between the different types. I must add, however, that in my own experience, some seed of American origin appeared to give the best results from the point of view of total yields, at the Roseworthy Agricultural College. Unfortunately, when I approached the seedsmen who had supplied this seed with a repeat order, they were unable to meet it.

At the present time we are thrown back on local supplies; and, so far as I know, providing the seed complies with the usual standards of quality I do not think that we have much to complain of. Good lucern seed should be haricot-bean shaped, bright-yellow in color, plump and well developed. A small proportion of impurities is unavoidable in the best of samples; it should not, however, exceed 2 per cent. to 3 per cent. The seed should always be guaranteed free from dodder.

On a germination test, it is generally probable that not more than 90 per cent. of the lucern seed will germinate; and allowing for impurities, this will give to ordinary good seed a cultural value of 87 per cent. to 88 per cent. Preference is sometimes expressed for two-year-old seed, on the ground that it germinates more regularly. Personally, however, whenever obtainable, I prefer seed of the preceding season.

#### FIRST-YEAR TREATMENT OF LUCERN FIELD.

If lucern has been broadcasted in autumn, there is nothing that can be done to the field until the first growth is ready for cutting. If, on the other hand, the lucern has been drilled in, it can, and should be, horse hoed as soon as the rows of lucern are sufficiently distinct for the purpose.

As has already been stated, in spite of careful fallowing, and all the more if fallowing has been neglected or omitted, weeds will spring up very freely in a recently sown lucern field; and during the winter months these weeds will make stronger growth than the lucern. I have known fields in which, by August, the lucern, although well germinated, was barely visible. This condition of affairs is apt to frighten those who sow lucern in autumn for the first time; I know of one grower to whom I had recommended the practice who proceeded to plough up the field rather than endeavor to control the weeds on the lines I shall indicate.

In spite of weeds, if in the early autumn the lucern had germinated regularly, it will in the spring still be found there beneath the shelter of the weeds, and all that we need to do is to proceed to get rid of the weeds by using the mower freely and repeatedly. The first cut given in August will prove a very effective check to them; a second cut given in September will give the lucern the start which it requires, and will enable it to smother out completely the weeds as the temperatures rise. It may be taken for granted that the third cut will be pure lucern, without any weed admixture. Moreover, no summer weed has any chance of growth in a recently established lucern field.

If a recently sown lucern field is carefully handled and irrigated, five to seven cuts, including the two initial weedy ones, may be taken in the course of the first season; and each cut, if dried, will average

within the neighborhood of 1 ton to the acre. I must insist very strongly that whatever may be the practice adopted later on, on no account should a lucern field be grazed, however lightly, in the first winter of its development. This injunction applies not only to sheep, which are particularly dangerous, but also to larger forms of livestock.

#### GENERAL TREATMENT OF LUCERN FIELD.

When the field enters upon the second year of its growth, the general treatment becomes normal. By this time the roots of the plant have become thoroughly well established, and the plants generally may be looked upon as being at the maximum of their productiveness. Among general cultural operations essential to success in lucern-growing, we may dwell upon the following:—

#### SPRING DRESSING OF MANURE.

We must recollect, particularly when irrigation is practised, that the drain on the land by a lucern crop is very considerable; hence, if we look to the continuance of high yields from year to year, we must be prepared to dress the field regularly in the opening spring months.

Lucern, like most leguminous plants, benefits chiefly by dressings, both of phosphates and potash salts. Potash, however, is a very costly manure, nor, indeed, is it obtainable at the present time. On the other hand, in the great majority of our northern soils, at all events, potash appears to be very abundantly present; the only difficulty is that it is not always readily available to the roots of plants; for this purpose it has, as a rule, to be transformed into sulphate. This result can be secured very readily and cheaply, by a suitable dressing of gypsum. Gypsum has the effect of mobilising the potash salts, and of enabling them to circulate freely and reach the deep roots of lucern plants. Hence, in the spring months of the year, I recommend a dressing of 3cwts. to 4cwts. of gypsum to the acre, and about 2cwts. of superphosphate.

Subsequently to this dressing, the lucern field can, with great advantage, be run over with a spring-time cultivator, in order to break through the surface crust and open up the soil. Little or no damage will be done to lucern plants. The use of farmyard manure is sometimes recommended as a suitable top dressing for lucern. Personally, I do not agree with this practice, providing always that a sufficient dressing of farmyard manure had been given prior to seeding.

#### GROWTH AND YIELDS OF LUCERN.

The growth and yield of lucern vary much with circumstances, the chief of which are probably temperature and an adequate water supply. Taking the latter for granted, the greater the heat the more rapid the

growth of lucern and the heavier its total yearly yield. Between August and April, under exceptionally favorable conditions of soil, temperature, and water, as much as 10 to 11 cuts of lucern have been secured, at intervals of three to four weeks' time. Under average conditions, however, five to six cuts, at intervals of five to seven weeks, are more usual.

Green lucern loses about 75 per cent. of its weight on drying; and we may reckon that each well-grown cut of lucern will correspond to about 1 ton of hay. As a rule, irrigation waters should be applied immediately after a cut; but in many circumstances, a second watering given between two cuts will lead to appreciably higher results. Needless to add that irrigation water must be tolerably free from saline matter; probably not more than 100 grains of total salt to the gallon is safe, even in very well drained land.

When lucern is not subject to irrigation, total yields are, of course, very much lighter, and depend, even when the water table is within easy reach, almost exclusively on summer rainfall. Personally, I am of the opinion that unirrigated lucern should always be drilled in rows, and tilled regularly after each cut. In these circumstances three to four cuts in one season may often be secured.

#### BEST TIME TO CUT LUCERN.

The usual recommendation is that lucern should be cut when about one-half of the field is in bloom. It is perhaps true that at this stage lucern is better relished by livestock as yet unaccustomed to it. It is highly questionable, however, whether at this stage, lucern has the best possible feeding value; in my opinion it is apt to be too hard and fibrous. Personally, I prefer cutting the crop just as the first flowers begin to appear.

Lucern, as is well known, may be fed in the green state, which perhaps is the most economical way of handling it. It involves, however, bringing out every morning the mower for the day's requirements. Livestock new to lucern do not always take to it readily at first in the green state, and it is generally advantageous to allow it to wilt slightly before offering it to them.

If all lucern available cannot conveniently be handled in the green state, it can be converted into hay. Or, again, this practice may be adopted as a general rule. The making of hay offers no particular difficulties; in the warmer months of the year it is fit to be shifted in a couple of days. The chief difficulty to be avoided is a tendency to brittleness in the hay, and as a result, a loss of leaf when carelessly handled; hence, when the weather is warm, it is usually safer to handle lucern hay in the cooler hours of the morning.

## GRAZING LUCERN.

There is not the slightest doubt that if we have in view the highest possible total yields and length of life, that it is inadvisable to graze a lucern field at any time; in other words, grazing both reduces the apparent productiveness of a lucern field and its life. Nevertheless, we are bound to admit that grazing lucern during the winter months of the year frequently offers high economic advantages, which, it may be, make ample compensation for its disadvantages. I, for one, confess that whenever possible during the winter months, I have always turned a lambing flock into a lucern field more than 12 months old; and it is a practice which I recommend to others. It goes without saying that when this practice is followed, the field calls for careful watching; at no time should it be allowed to get too bare, and whenever the surface becomes too wet, the flock should be temporarily removed.

## HOW LONG SHOULD A LUCERN FIELD HOLD OUT.\*

There are some who appear to entertain the belief that a lucern field, once sown, should continue productive almost indefinitely, and who attribute to carelessness or neglect any tendency to falling away on the part of the field. Undoubtedly care and attention will, within certain limits, lengthen the period of profitable productiveness of a lucern field; nevertheless, Nature has set certain limits beyond which we cannot go. It is true, perhaps, that individual lucern plants appear to persist for an almost indefinite number of years, but it would be rash to assume that the sum-total of individual plants which constitute the lucern field will be able to do the same. As a matter of fact, if the field is to be reasonably productive, individual plants are far too crowded to be able to occupy the same land for any length of time; from year to year individual plants will gradually die out throughout the field, which becomes correspondingly thinner and thinner, with corresponding yields lighter and lighter, until, if we take the cost of irrigation into consideration, the field no longer pays for handling. Eventually, as is often the case in the opening stages of growth, the sparsely clad field may carry more weed growth than lucern.

The average lucern field may be taken to be at its best in the second year of growth; and thereafter it slowly declines. There are some fields, particularly if over grazed, that are not worth irrigating after their fifth year; and there are very few that are worth irrigating after their tenth year. Hence, when laying out land for irrigation purposes, it is as well to have within reach a sufficient area to bring in alternate periods, under lucern at one time and under some other type of crop at another time. When the lucern field is played out, or when it no longer pays to waste water on it, it should be ploughed up and either

grazed or brought under some other type of crop for a number of years. In the meantime, a new area of land could be placed under lucern.

It is very unwise to sow lucern a second time on old lucern land at too short an interval between two crops. Not less than four to five years should intervene between two lucern crops. In the intervening years irrigated crops, such as maize or sorghum, can be grown, or ordinary winter crops, such as any one of the cereals.

#### LUCERN AS A PURELY GRAZING CROP IN RELATIVELY DRY AREAS.

Hitherto I have dealt with what might be called the orthodox methods of handling lucern; but, as farmers, even in relatively dry districts, we can often put it to other important uses. We can, with great advantage to ourselves, treat it as a purely grazing crop. In this connection, I shall describe a practice which I successfully followed for several years at Roseworthy.

Every season I used to sow about 20 acres of lucern in an ordinary cereal hay crop. The hay crop was first drilled in, in the ordinary way; we then broadcasted lucern over the selected area at the rate of 6lbs. to 8lbs. of seed to the acre; and the seed was subsequently lightly rolled in. When sown in this fashion, the lucern plants grow up in the shelter of the hay crop, and make a very fair showing by hay harvest time. Occasional failures are, it is true, unavoidable; but if due care be taken, general results are usually satisfactory. The young lucern should not be grazed too soon after the removal of the hay crop; time should be given to it to harden and to get a firm hold of the ground. Generally speaking, the first grazing should not take place before April. In the years that follow, the lucern can, of course, be grazed whenever it is found convenient to do so. In this connection, grazing lucern laid down in this way will be found exceptionally useful in relatively wet summers, in which the dry feed is more or less spoilt. Naturally, in summers such as these, the growth of the lucern is above the average. Personally, I generally endeavored to reserve these lucern fields for the autumn grazing of lambing flocks.

The constant grazing to which these fields are subject, tends to shorten considerably the life of the plants. Generally speaking, grazed lucern fields should be broken up and brought back into the ordinary cropping rotation in their third or fourth year; hence, if you make it a practice to put down 20 acres under lucern every year, you will usually have from 60 acres to 80 acres of lucern at your disposal for grazing purposes, and this will represent an exceedingly valuable farming asset in any district.



There is, of course, one difficulty attaching to this practice, and that is the essentialness of providing for the purpose small fields adequately supplied with water. Such an arrangement, however, is unavoidable on all those farms whose owners have the pretension to handle livestock adequately; and in my view, those who are not prepared to make every necessary provision for handling livestock had better leave them alone.

#### ENGLISH MALTING BARLEY.

The Director of Agriculture (Professor Arthur J. Perkins), in reply to a correspondent at Georgetown, who sought information in respect to English malting barley, states:—"I am rather doubtful that you will be able, on the average, to secure in the neighborhood of Georgetown what maltsters term "good malting sample." The chief difficulty in most districts north of Adelaide is that the climate is not favorable to the development of first-class malting barley. The grain ripens off too suddenly, and is generally too coarse and thick in the skin. In my experience, it is only in very exceptional seasons that first-class malting barley can be secured. I do not, however, wish to discourage you altogether on the subject, and as there is nothing like experience, I suggest your testing the barley on a moderate scale for yourself. Generally speaking, malting barley does not require conditions of soil of exceptional fertility, and in the circumstances, it is not necessary to fallow the land for barley. Barley, indeed, forms, in my opinion, an excellent crop to follow wheat; the stubbles should be broken up lightly early in autumn, and the barley should be sown rather late in the wheat seeding time. In your district end of May and early June should, in ordinary circumstances, prove satisfactory, although it is quite possible to sow barley considerably later. Generally speaking, barley is better adapted to light land than to heavy clay. I should certainly advise you to pickle the barley in the same way as you would pickle wheat, with 1 per cent. solution of bluestone, that is to say, 1lb. of bluestone to 10galls. of water. Bear in mind, however, that in the case of barley badly affected with smut, the pickle does not necessarily destroy all the smut germs on the grain, because some of the smut germs are internal, between the skin and the grain. The best practice is to endeavor to secure seed quite free from smut. If I cannot recommend for your district malting barley, I can recommend the best types of feed barley, good strains of which are always obtainable from the Roseworthy Agricultural College."

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

## Conference of Lower Eyre's Peninsula Branches.

*(Continued from page 717.)*

## AIDS TO PROGRESSIVE AGRICULTURE ON CENTRAL EYRE'S PENINSULA.

A lengthy paper with this title was contributed by Mr. W. Beisel (of the Cummins Branch), in the course of which, after referring to the early settlement of South Australia, he mentioned that the past five years had proved disastrous to many settlers in portions of Central Eyre's Peninsula. Through a variety of circumstances which he enumerated, many had been compelled to abandon large tracts of partly cleared land. That exodus had cast a shadow over many of the relatively good qualities of the land, but he had every confidence in the ultimate success of agriculture in the district.

He then proceeded to deal with the composition of the soil of the Central Eyre's Peninsula; deducing that it was rich in inorganic and mineral matter, but deficient in organic constituents. The destruction of the natural flora, for the most part mallee, should be the first aim of the settler, he said, and such an undertaking made smaller holdings imperative, which would assure a larger population, and cheaper transport facilities, and considerably improve internal conditions, both economic and social. After having dealt with the climatic conditions, he then proceeded to discuss the question of resettlement, urging the need for very liberal concessions and assistance to intending settlers. The regrading of terms of purchase, rental values, and land taxes for the district should receive the immediate attention of the Government. As to the settler, the writer of the paper enumerated his necessary possessions as follows:—The virtue of economy and a fair amount of capital; ability as a cultivator of the soil; a keen sense of foresight, observation, and judicious application; system, industry, and an open mind for new and better scientific methods; knowledge of stock; originality in experimenting. Reasoning from the experience of those men who had succeeded, the conclusion was reached that the profitable returns were in direct proportion to the use the land was put to in well handled mixed farming—the growth of fodder crops, sheep-farming, dairying, poultry-keeping, and pig-raising. Forage should be the primary production; grain secondary.

By way of illustration, the hypothetical case of a purchase of a 640 acre holding of virgin scrub land was discussed, the necessary plant, mode of procedure, and prospective returns being dealt with. Reverting to the general question of settlement, the paper writer stated that drainage of the land would probably be the first step in the direction of soil improvement. There was a considerable slope from the Eastern Range toward the sea, and a properly carried out drainage system would be of immense value. Deep cultivation should go hand in hand with burning. The acidity of the soil could be corrected by intense

tillage, and the application of humus, farmyard and green manures. He then proceeded to enumerate the difficulties of distribution which confronted the settler, concluding that the first factor to success was the provision of suitable shipping facilities. The principal directions in which Government aid was necessary were detailed as follows:—(1) Reduction of purchase-money, rents, taxes, and terms of payment; (2) Advances on clearing, grubbing, fencing, netting, drainage, erection of permanent buildings; (3) provision of water and live stock; (4) introduction of bacon and butter factories, freezing works, and produce depot; (5) better transport facility—roads, postal, railway, and shipping; (6) better educational advantages for children of pioneers.

In the course of the discussion which followed the reading of the paper, Mr. Palm agreed that the central areas of Eyre's Peninsula suffered through having a bad name. Pioneers in that district had not always had the consideration that they deserved. By way of illustrating the possibilities of the country he had brought along for exhibition samples of a number of products, including mangolds, kale, vegetables, fruit, and flowers grown without any water except the natural rainfall. He believed that with the adoption of mixed farming many of the holdings that had been abandoned would be taken up again.

#### FREE PARLIAMENT.

At the instance of Mr. J. Newell, of the Koppio Branch, consideration was given to the question of inaugurating a sheep dog trial. It was decided to leave the matter in the hands of the Koppio Branch, to call a meeting of representatives of Branches interested at a convenient time and place. "Soils and their Cultivation," was the title of an address delivered by the Superintendent of Experimental Work (Mr. W. J. Spafford). This was followed by a paper, contributed by Mr. R. Myers, of the Mount Hope Branch, as follows:—

#### FRUIT-GROWING ON EYRE'S PENINSULA.

"The fruit-growing industry does not seem to be receiving the attention on Eyre's Peninsula that it should. The few experiments that have been tried have, where proper methods and cultivation have attended them, proved a decided success. In my opinion there are thousands of acres of land on lower and middle Eyre's Peninsula that have been condemned for cereal-growing, which would prove a valuable asset to the State if fruit cultivation were carried on. My experience has proved that fruit trees and vines will flourish and bear an abundance of fruit without any artificial irrigation, providing that the land is well worked and kept in a good state of tilth. One of the first things a man should do when he takes up a block of land is to plant a few fruit trees and vines—not too many for a start—say, half an acre, and keep them well cultivated and attended to. He will soon learn from them whether the soil and climatic conditions are suitable. If they thrive he can launch out on a larger scale, always taking care to give the trees plenty of room; 20ft. to 25ft. is the usual distance to plant the trees apart in the rows, and plant on the square. This will make the orchard easily and cheaply worked by horse implements. To prepare the soil for fruit trees I would use the plough, fallow the land this season, and plant it

the next. When planting I would plough to a depth of 9in. with a mouldboard implement, to be followed by the subsoiler to a depth of 18in. or 2ft." A general discussion on the suitability of the district to fruit production then took place.

The Conference closed with votes of thanks to the visiting officers, paper-writers, and the chairman.

### Conference of South-East Branches.

Representatives of the Branches of the Agricultural Bureau situated in the South-Eastern district met in Conference at Naracoorte on Wednesday, April 17th. The attendance was large, and under the presidency of Mr. S. H. Schinckel, the meeting managed to get through a full agenda paper without hitch and with commendable punctuality.

The delegates from the different Branches were:—Kalangadoo—H. Mills, D. MacCorquindale, W. Boyce, D. W. Tucker (hon. secretary); Kybybolite—G. H. Hahn, L. S. Davie, A. Bradley, A. H. Bradley, S. Shepherd, E. Schinckel, J. Hammat, N. Lloyd, A. R. Scholz, C. Scholz, A. Hahn, C. Hahn (hon. secretary), P. Glynn, A. Gibbs, P. Anderson; Kongorong—C. S. Atkin, E. E. Morrison (hon. secretary); Naracoorte—S. H. Schinckel, W. Staude, C. F. W. Staude, W. H. Smith, E. S. Alcock, C. Bray, S. Staunton, Rev. F. W. Brasher, F. A. Holmes, A. C. DeGaris, W. Rodgers, W. Loller, S. Hart, Geo. Ludwig, A. Jones, J. B. Nalon, Geo. Turnbull, T. Munn, D. Munn, A. J. Johnson, R. E. Chapman, Alex. Johnstone, J. M. Wray (hon. secretary), W. Williams, J. T. Tidy; Coonawarra—P. J. Lynch, J. Clayfield, H. A. Reschke (hon. secretary); Mundalla—A. C. de la Parelle (hon. secretary), G. H. Saxon, F. Wiese, J. E. Staude; Tatiara—T. Stanton (hon. secretary), A. Fisher, Pastor Edwards, R. Langley; Millicent—J. B. Mitchell, J. Mullins, G. Searle; Glencoe—J. T. Halliday, G. F. Ferguson (hon. secretary), J. Dowe, T. Gratwick; Frances—M. Herold (hon. secretary), L. Herold, G. Holmes, H. G. Pfitzner, L. Krahnert; Penola—P. H. Kilsby, F. Kidman, W. A. Clifford, E. Hinze, W. Miller, T. Oswald, S. Ockley; Mount Gambier—C. T. Major, D. A. Collins (hon. secretary), A. Sassanowsky, H. Buck; Lucindale—P. Dow, J. Dow, F. F. Gratwick, G. F. Ferguson (hon. secretary), J. T. Halliday; Kybybolite—L. S. Davie, C. Hahn (hon. secretary), S. Shephard, E. C. H. Schinckel, A. Bradley, A. Bradley, sen., C. Schultz, R. Schultz, H. H. Orchard; Tantanoola—F. J. Bateman, P. Keily, A. R. Oberlander.

Mr. Geo. Jeffrey (Chairman of the Advisory Board), Professor Arthur J. Perkins (Director of Agriculture), Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S. (Principal Roseworthy Agricultural College), Mr. Geo. Quinn (Horticultural Instructor), Mr. H. W. Andrew (Botanical Assistant), and Mr. H. J. Finnis (Acting Secretary Advisory Board) represented the Department of Agriculture.

At the invitation of the Chairman (Mr. S. H. Schinckel), who extended a welcome to the visiting delegates and officers of the Department, the Chairman of the Advisory Board opened the Conference.

Mr. Jeffrey said it almost seemed out of place to have a meeting of that kind to discuss matters even so important as agriculture whilst the fate of the nation was hanging in the balance in Flanders. But those who had tried to do their duty in the past, and had done all that they could, could only sit by for the moment and await, with bated breath, what was going on on the other side, and pray that they would get that victory they believed they deserved, and which was not only in the interests of the British Empire, but necessary for the benefit of civilised mankind. They, however, had a work to do, and there never was a time in the history of the nation when it was more necessary to encourage by all means in their power, the primary producer.

#### ECONOMY—TRUE AND FALSE.

If he were Minister of Agriculture, he would probably "get the sack"—(laughter)—because he would institute a policy which would mean spending money. However, if it meant spending money, it would also make for the betterment of the primary producer in every respect. Whilst national and private economy were absolutely necessary, it was false economy to be cheeseparing where the primary producer was concerned. If they were going to meet the tremendous burden of taxation, they would have to do it through the primary producer. It was of no use to say that they had no money for the purpose of fostering their industries. That was foolishness. They had plenty of money. There never was a time in the history of Australia when there was so much money. It was a question of its judicious expenditure, and the Government which refused the necessary money to spend in helping the man on the land to produce more economically than he had done before was criminal in its lunacy. He was hoping that in the days that were to come the Government would do all in its power to help the producer. But the producer had just as great a responsibility as the Government. The man who did not put forth every effort to produce, and produce economically, everything that it was possible for him to produce, was not only an enemy to himself, but an enemy to his country. The Government had done great things in the past, for instance, by the introduction of the wheat and wool schemes. The scheme for the distribution of fruit would also prove of great benefit.

#### LIME.

If they were to get the most out of the soil in the South-East, it seemed to him that running on all fours with the question of tillage was the use of plenty of lime as soil dressing. They had the lime in abundance in that district, and they should be able to get the railways to give them cheap rates, or even to carry it free. He concluded by assuring the gathering that the Advisory Board was at all times willing to do all in its power to assist the agricultural interests. He then declared the Conference open.

#### GRASSES MOST SUITABLE TO THE SOUTH-EAST.

The following paper was read by Mr. D. W. Tucker (Kalangadoo Branch):—"I have chosen this subject, as at the present time it should be of interest to almost every one who has anything to do with the

land. With the high cost of producing cereal crops, coupled with the low prices for the crops, it has been found almost impossible to grow them with even a very small profit. Therefore the great majority of the landholders have had to turn their attention to grazing, that is wool-growing and dairying, to make the best use of their holdings. It should then be their object to produce as much fodder or grass as possible, and of the best quality, as the natural grasses in many parts of the district are of rather a poor quality, especially in very wet winters. There are many thousands of acres of land throughout the lower South-East well adapted for the growth of artificial or English grasses, and it is surprising that only such a small area is grown seeing that they give such a very much better quality of feed than the natural grasses. In the first place every farmer should put aside a small plot of, say, one or two acres, as an experimental plot, where several of the best-known varieties of grasses could first be tried so as to find out which would best suit the soil and locality; also to produce seed, as I have always found that seed produced in the locality is much better than that imported from New Zealand or elsewhere. Of the varieties which I have found most suitable for the heavy land, I place the perennial or English rye grass first. It grows well in many parts of the South-East, and is without doubt a very fine fodder for fattening, dairying, or general grazing purposes. It is very handy, and when once established stands a lot of feeding, and all kinds of stock are very fond of it. The method which we have found most successful in growing this grass is to plough the land in the summer, and sow with the first rains in the end of March or the beginning of April. The seeding should be as heavy as possible—2bush. of seed to the acre is not too much. It is much better, in my opinion, to sow 10 acres well than expend the seed over a larger area and have a thin seeding. I like to sow with the grass seed a cover crop of oats or rye at the rate of about 1½bush. to the acre, with about 50lbs. or 60lbs. of super. to the acre. This gives the young grass a good start, and would allow stock to be turned on much quicker and without injury to the young grass; the cover crop protects it until it develops a good strong root. I do not care for Italian rye grass, as it is only a spring feed; at that time one has plenty of other feed. It is also very hard on the land. Cocksfoot is also a very good grass. It does well in most heavy soils, but does not stool like the rye does, and has a tendency to become bunched when fed off by stock. A little mixed with the rye does very well, and will keep green the greater part of the summer, and like the rye will shoot up green with a very light rain. There are many different kinds of clovers. They are mostly spring fodders, and are very little good during the winter or summer so I would not pin much faith in them. They make very fine hay. There are many others which may be worth a trial, but time does not permit my dealing with them now. Now as to the poorer class of land. This is a far more difficult matter to deal with, but in my opinion for the lighter and drier land one cannot find anything that will give better results than the common spear grass, or Black Prairie (the spear grass which grows in the North is quite a different grass to that which is known as spear grass in our district). This grass grows well almost anywhere, and gives a good quantity of feed of a fair quality; comes

with the first rains, and lasts the greater part of the year. It does not require much cultivation, and when once established it remains. It makes very good hay when cut green. Yorkshire fog is another grass that will grow almost anywhere on good dry land. It is a very poor feed, but on wet, boggy flats, where it will keep green and succulent throughout the summer, stock do fairly well on it. It should always be kept fed down short, because when it becomes long and rank it is of very little use. We may regard it as a grass suitable for poor country; it may not fatten, but many a time it will fill when there is nothing better. Another grass which is spreading a good deal in our district is couch grass. This grows anywhere—on dry or wet land, on poor sand, or rich soil. I have seen it during the present summer growing and keeping green where everything else was dried up. Stock seem to be very fond of it, as they keep it very short wherever they can get at it. I have seen it covered with water for weeks at a time, which did not seem to injure it at all. The grass, I think, is worth a trial in poor country. These are just a few of the many grasses which have come under my notice, and I hope may prove of some interest to those present."

#### OTHER OPINIONS.

A general discussion followed the reading of the paper, and a number of questions were put to and answered by the writer of the paper. He mentioned that he had seen rye grass covered with water for some considerable time and still do well. He did not care for the Italian rye grass, but the Perennial rye grass should be worth a trial. Mr. Sassanowsky (Mount Gambier) said there was a prevailing idea that after a paddock had been under rye grass for four or five years, and a wheat crop was put on the land, the wheat crop was generally very poor. He desired to know whether that had come under Mr. Tucker's notice. Mr. Tucker, in reply, stated that if the land which had been carrying the rye grass were broken down with pease the following cereal crop should be a success; excellent results had followed that practice in his case.

Mr. Bateman (Tantanoola) mentioned that four years ago he broke down 40 acres which had been carrying rye grass for over six years. The land was then fallowed, and the following wheat crop averaged 40 bush. to the acre. That was on black flat land. Mr. Tucker stated that the chief difficulty he had had with the rye grass was the appearance of caterpillars, which had eaten the grass right out. However, where the caterpillars had been working in the soil, the following crops did remarkably well.

Mr. Halliday (Glencoe) spoke of the value of couch grass, and suggested that steps might be taken to improve its feeding qualities.

Professor Perkins stated that that was the first time he had heard couch grass well spoken of. He had had experience of the grass in different countries, and he recollected an instance in a country where labor was much cheaper than in this State, in which it had cost £20 per acre to get rid of it. The trouble was that the grass would grow practically anywhere, and it would adapt itself to almost any conditions. Although stock would take to it, it could not be described as a good

grass. Whilst it was young the stock would eat it, but it rapidly became hard in the summer. In that particular district most of the grazing lands were under what they termed temporary pastures. They would be exceedingly sorry if they attempted to break up land that had carried couch grass for any length of time. The crop would be very much worse than that grown on land that had carried rye grass formerly. In the lighter types of soil they would probably never get rid of the couch. The only possible place in which it might be of some use was in very poor lands, where nothing else would grow. It spread by means of underground stems, and the more the land was cultivated the more it spread.

#### FARM COMPETITIONS.

To the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric), M.R.C.V.S.) was entrusted the duty of presenting to the successful competitors the certificates which formed the prizes for the farm competitions conducted by the Naracoorte Branch. Before making the presentations Mr. Colebatch stated that there was no question that the district which had held competitions was amongst the most progressive that they had in the State. It was an indication of keen interest, and evidence that the residents of the district had not become *blase* in regard to progress. He was pleased to see that although they were not in a position to give high money prizes competition was still keen. He was sure that those who had won certificates would hold them up to successors as something to attain to in the management of the farms they were working. He noticed that they had a competition for the best-worked fallow. It was a question as to the basis on which they should judge that. He thought it would be a good thing if they could go on and judge the crops that were grown on the fallows of last year. He congratulated them as one of the first districts in the State that had the enterprise to go in for these farm competitions, and distributed the awards as follows:—

Class 1.—Best-worked and managed farm, over 500 acres, first prize, R. A. Miles.

Class 2.—Best-worked and managed farm, under 500 acres, first prize, A. R. Scholz.

Class 3.—Best growing crop of wheat. First, S. H. Schinckel; second, R. A. Miles.

Class 4.—Best-worked fallow land. First, S. H. Schinckel.

Class 5.—Best growing crop of Algerian oats. First R. A. Miles.

#### FRUIT TREES ON THE FARM.

The following paper on this subject was contributed by Pastor Edwards, of the Tatiara Branch:—"In presenting this paper for your consideration, I feel that I may be charged with the fact that I have not produced any new thoughts on this well-known theme. Let me hasten to state that my object is not to claim any knowledge which is not possessed by the average member of this Bureau, but to emphasize the importance of this subject, and to help, if possible, to encourage a greater interest in fruit culture in connection with the farm. First I would like to voice a strong protest against the almost universal belief



that it requires an expert knowledge before anyone can make a success at fruit-growing. This belief has hindered many from making the attempt, and also caused many to give up after having spent a lot of time, and perhaps money, in making a start. It will be readily agreed that a small orchard of well-selected trees adds not only to the health and comfort of the farmer and his family, but also to the value of the property. In fact, I know of several farms in this district that have little to commend them save the fact that the homestead is surrounded by a nice orchard of well-kept fruit trees. So the question, 'Does it pay?' which is always a vital question with the farmer, is at once answered in the affirmative. There is another question that also must be considered, and it is:—Does fruit-growing interfere with the other work on the farm? This can be answered by stating that to some extent it does, but its advantages far outweigh its disadvantages in this direction, if the orchard is planted with the object of becoming a commercial concern, then it must have its share of attention like any other enterprise, but if it is planted with the object of adding to the comfort and profit of the home, then it need not interfere with the work of the farm at any time. Now let me endeavor to answer a few questions that the man who is anxious to start a small orchard is likely to be asked. Which is the best position to select? If possible an east or north-easterly position on high, sloping ground. If you have your house on a hill, select the ground on the north side, never on the south or west if you can possibly avoid it. What area should the orchard contain? This depends very largely on the amount of time you are prepared to give its cultivation in the future. Far better to have a small orchard of *one acre* and look after it properly, than lay out a large one and find that you cannot spare the time to attend to it. My ideal is an orchard of about *two acres*. How should the land be prepared? If it is the virgin soil (and virgin soil is always best for fruit trees) plough the land to the depth of a foot if possible, but not less than 10in. in any case, ploughing as early as possible after the first autumn rains. Leave it lie for a month or so to sweeten, and then plough it cross ways or harrow it with a strong harrow. Do not worry about it being rough, the more air that gets through it the better. The land is now ready to receive the fruit trees. Where shall I get the trees, and what trees shall I plant? These are the questions that, if answered rightly, will go a long way towards making your orchard a success, and if answered wrongly will land you among the many farmers who have made a failure of fruit-growing. Where shall I get the trees? Straight from a reliable nurseryman, *not from travelling agents*. A good nurseryman does not need to keep a traveller, and the farmer cannot afford to pay the fancy prices that travelling agents charge for the trees. In selecting trees, care should be taken in seeing that they are not more than one year old. I know that some will disagree with me on this matter; but hear me before firing your gun. A yearling tree with its tender root formation is better able to stand the process of transplanting than a two or three year old tree. If you purchase a yearling you are sure that it has only received one check, whereas a two year old may be, and very often is, a reject of the previous seasons culling, and has already been transplanted once in its

short life. This is the reason why so many trees die during the first year or so in the orchard, and also why those that live are so slow in coming into bearing. What trees should I plant? This will depend on the purpose you have in view. If for home use, you may plant according to fancy. It is always wise to study what variety of fruit does best in the district. In this district almost any fruit can be grown to some extent, with the exception of cherries and, of course, berry fruits. Peaches and apricots seem to excel perhaps, but apples and pears do well, and will repay the grower. My idea is that the farmer should study to have a selection of early and late fruit of each variety, also good cooking and preserving varieties. Go in for well-known standard varieties, and leave the new and recently introduced ones to those folks who have more time and money to waste than the average farmer. If you desire to become an exporter, then you must plant fruits that will stand packing and carriage. What is the correct time to plant? In this district, during June or July. The average nurseryman starts lifting his stocks of saleable trees on May 1st, they are then heeled into the ground to await sale, and usually the early buyers get the best trees. How should the trees be planted? There is only one correct way to plant trees, and that is to place them in the ground in as near the same position as they grew while in the nursery. The best way to do this is to set your land at whatever distance you desire to have the rows, and also peg out the position for each tree. Dig the ground to the full depth of the spade for a distance of about 4ft. where the tree is to be planted, then remove the soil in the centre, just sufficient to allow the roots of the tree plenty of room, throw in a handful or two of super., place your tree in position, fill in the soil, and firm it with your foot, holding the tree in position while doing so. Be careful not to plant the tree deeper than it was in the nursery; you can easily tell by noting the color on the main stem. Avoid pot-hole planting if you wish to have healthy trees. There are two things which are well to remember in planting—first remove with a knife all bruised and jagged spade marks from the roots. Second, cut all limbs hard back to at least two or three eyes from the stem. Now I am conscious that this paper is not by any means what I would like it to be, but if it will help to create an interest in this important subject I shall be well repaid. I have not dealt with the care and pruning of the orchard, as that would require a paper to itself."

The paper excited a good deal of interest. Mr. Loller (Naracoorte) mentioned that dressing the soil with coarse bone prior to planting the trees would be found advantageous. Mr. Clifford mentioned that cherries had done particularly well at Penola. The Horticultural Instructor (Mr. Geo. Quinn) stated that any trees that bore on small spur growth, such as the plum, apple, and pear, needed pruning to frame the tree, for four or five years, and if the trees were vigorous the better plan was to let them have plenty of run. It was a good plan, supposing they had a tree well framed up, to let it go for a year unpruned. That was not the time to trim up the leading shoots and the laterals. If the tree were very dense they could just thin out the laterals and allow the light to enter, but they should not cut the leaders. When they were building up a young tree they wanted to infuse vigor into it, and hard

winter pruning tended to stimulate vigorous growth. The best way to check the growth of a young tree was to let it grow unpruned, and if it still grew very vigorously they could interfere with the root action by dropping tillage. When the tree had borne several crops they could start to prune it again. Mr. Ferguson expressed the opinion that two acres of orchard would be too large for most farms. One half-acre of orchard would be almost sufficient.

#### SHEEP MANAGEMENT IN THE SOUTH-EAST.

Mr. Trevor Williams contributed the following paper:—

"I take it for granted the manager is expected to prove his capabilities by giving the best financial results from a given area, not only without deterioration of flocks or land, but, rather, improvement of each. The result aimed at is not necessarily the best flock, but the best-paying flock. Good management's first demands are—What is the nature of the land? The climate? The area?

"Given a concrete example, with these three questions answered, this paper would be comparatively easy. But seeing the South-East has at least two climates, and land in quality ranging from scrub to first-class fattening, all of which owners wish to know how to manage most profitably, it is patent we must narrow down to either generalities or concrete cases. I will try the latter, hoping it may stimulate more definite and concentrated discussion.

"Regarding climate, I will just make this general statement—the lower South-East demands a stronger cross than the northern, or a stronger Merino, as the case may be.

"Case No. 1.—Runs of, say, 4,000 sheep to the largest station. For flocks of this size we can eliminate the fatterer, as very few first-class fattening land owners carry over 4,000 sheep. Therefore the purpose generally on estates of this area is—First, wool; second, lambs; third, topping off surplus stock. The land in this case will be of mixed quality. Seeing, therefore, we have large flocks running on mixed quality, from experience and observation I recommend a uniform flock of pure-bred Merinos of the strongest and most robust type available, but never losing character, length, and quality, showing marked serration over the whole body. Rams showing these characteristics should be sought for till found, with large frames and plain bodies. The strength of fibre generally denotes good constitution, and good constitution is the most important basic qualification for the wet South-East. Points of management, as given later, will apply generally in all cases.

"Case No. 2.—Fattening properties, first class, as noted before, are almost wholly areas carrying under 4,000 sheep, regarding which my experience is small; but as the object here is to fatten, wool is secondary, and lambing not generally practised. Therefore it remains with the manager to purchase and choose from the many fattening English breeds. I would place these for the South-East in following order—(1) Romney Marsh; (2) Shropshire; (3) Lincoln or Leicester (first and second cross). The Romney, I think, would prove the most profitable for wool and carcass.

Case No. 3.—Grazing areas of from 4,000 sheep downward. This embraces the area of the the most numerous class of properties, down to the small and mixed farms, with mixed quality of land. Now, no definite type should be fixed upon until the manager has examined his country, and much depends on his right conclusions, selecting a type most adaptable to the particular characteristics of his property. For the general average holding of this case I would strongly recommend the foundation to be a Romney Marsh-Merino half-bred or Lincoln-Merino half-bred ewes. Mate these with the same beautiful, large, strong-wool, pure Merino rams, as recommended in case No. 1. These rams are generally known as 'Northern blood.' Mate these rams with ewes bred truly of above types. The progeny is again mated with rams of same quality, *i.e.*, pure bred, and go on using pure-bred rams till your flock is practically, but not theoretically, pure Merino; then I maintain the result will be a type for the South-East, like the famous pure breeds are for the North. We must have the British breed foundation to fix a type constitutionally strong enough to stand the South-East climate and pastures. To maintain this constitutional fitness, none but strong-wool, large-frame rams must be used. It may, on some classes of land, be found even then the type will weaken; if so, I see no other remedy but to again introduce the half-bred ewe. These rams can always be purchased around Adelaide, but we have local breeders who have produced flock rams second to very few, if not equal to any, in South Australia.

Case No. 4.—Farms and runs that have not sufficient suitable land to lamb—largely scrub lands or light gum country. For such, I recommend the purchase of sheep bred on the lines of case 3, *i.e.*, the first 'Comeback' or subsequent 'Comebacks,' or from that to a pure strong Merino. The class I recommend I have bred, and find them good 'doers' on any class of country, compared with any other class; either finer or stronger do not thrive so well.

"As to general points on management, equally applicable to all cases, you should never keep a dry sheep where you can breed a good lamb. Always understock till you discover you are safe full stocking, and never overstock. The overstocking manager has helped to deplete the flocks of Australia and his own banking account more than any other cause. Do not, on any account, sell a ewe under five years, unless she is a cull or surplus. Cull ewes heavily, if needed, at first, if they do not absolutely satisfy the eye for size, constitution, and general appearance. You can add quality any time once constitution is secured. Sell out, and keep remarkably good feed for ewes and lambs. Sell only culls (any age), cast for age ewes, and wethers. Keep the latter till three years if it can be done without damaging lambing. Do not let it damage lambing; rather sell wethers younger. Months prior to shearing have your prospective sale ewes in paddocks best suited to bring them forward. Do not try how many sheep you can carry, but how much net profit you can make, *i.e.*, do not run a hobby unprofitably. Be careful to crutch at least all ewes to lamb and ewe weaners about April. Take Solomon's advice—'Be diligent to know the state of your flocks'; always keep going through to watch for first wrong

twist of their tail. Always keep a hospital paddock, with tip-top feed; it can be used for topping off surplus if no patients are in from the flock, but weaners are almost sure to give some trouble. Do not wait till they are bad. During the latter part of summer bring in fortnightly any showing signs of indifference. Always sell true to age and type as truthfully as you hope to buy, thus establishing a good name for the manager as well as the sheep. Do not let rabbits make holes in your paddock or pocket—it is one and the same thing. Keep plenty of salt mixture under cover, in troughs, if you think your pastures warrant it. Keep the water supply ample and clean, especially in summer. Do not use the old-fashioned waterhole; rather pump by hand till you can afford a windmill. Do not say that is good advice and not act on it.

"Lastly, we must all remember, and always remember, the breeding is only half the management; the other half is what goes down the neck. Thus it is the right breed, rightly cared for, rightly fed, from January 1st to December 31st, that pays."

The discussion was opened by Mr. Geo. Jeffrey, who expressed his entire agreement with the remarks of Mr. Williams in regard to the type of ram to be used. Under the present wool scheme, he continued, length of staple counted more than ever it had done under the old system. At the meetings of the Advisory Committee emphasis had been laid on the importance of encouraging length of staple. Under the old conditions quality had a determining effect in regulating the price, but quality did not to-day occupy the same position. Quality, of course, had its place, but nothing like that which it had formerly.

### Free Parliament.

### NEXT CONFERENCE.

It was determined that the next Conference should be held in 1919, the Coonawarra and Penola Branches being jointly responsible.

### ANNUAL CONGRESS.

At the instance of Mr. Collins, seconded by Mr. Sassanowsky, it was decided that the Conference should recommend to the Advisory Board that the annual Congress should be confined to lectures by the expert officers of the Department of Agriculture, except in the case of the Free Parliament.

Mr. Staude moved that it be a recommendation to the Advisory Board that there should be no session of Congress held on the Tuesday morning of the Congress week, in order that delegates might attend the ram sales without missing a Congress session. Carried.

The Horticultural Instructor (Mr. Geo. Quinn) then replied to a number of questions that had been previously submitted by Branches. He dealt with the treatment of black aphid and curl leaf of the peach, black spot of the apricot, explained factors that caused the dropping of fully formed cherries, and detailed the cause and cure for gumming of cherries.

*(To be continued.)*

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, April 10th, there being present Messrs. Geo. Jeffrey (Chairman), Professor Perkins, G. R. Laffer, M.P., T. H. Williams, F. Coleman, W. J. Colebatch, A. M. Dawkins, J. Miller, and H. J. Finnis (Acting Secretary).

Apologies were received for the absence of Messrs. A. W. Shillabeer and C. J. Tuckwell.

An intimation was received from the Hon. the Minister that he was considering the question of holding a Conference with a view to discussing proposals for the expansion of the dairying industry. It was decided that the matter should remain on the agenda for consideration at the next meeting of the Board.

### AUSTRALIAN-MADE CORNSACKS.

The Hon. Minister of Agriculture intimated that if the Government were to take up the matter of enforcing a standard of size and quality for Australian-made cornsacks it would be necessary to secure additional evidence of the necessity for this course. It was decided to request the Wheat Harvest Board to supply a report on this matter.

### COMPULSORY DIPPING OF SHEEP.

Questions relating to the question of compulsory dipping of sheep within district council areas were raised by the Gawler River, Morehead, and Mundoora Branches. It was decided to transmit the information contained in these communications to the Minister of Agriculture.

### ILLUSTRATED BOOKLET OF WEEDS.

The Clanfield Branch of the Agricultural Bureau suggested that a book containing information relating to the weeds of this State, illustrated in color to facilitate identification, might be published by the Department of Agriculture. The matter was considered at length by the Board, the Chairman taking the opportunity of emphasizing the great importance of rendering every possible assistance to primary producers. They must not stop at legitimate expense in that direction. In the course of the discussion it was pointed out that the Department of Agriculture was prepared to identify weeds on behalf of farmers. On the motion of Mr. Laffer it was decided that the Branch be informed that their suggestion was not practicable at the present time, and that they could get any weed identified by sending it to the Department.

### HORTICULTURAL EXPERIMENTAL WORK.

The Lenswood and Forest Range Branch suggested that one of the Horticultural Instructors might be set aside to supervise horticultural experiments to be carried out in different parts of the State. It was decided to refer the suggestion to Mr. Quinn.

The Mount Gambier Branch suggested that steps should be taken to prevent wheat affected by weevil being introduced into that district. It was decided to ask the manager of the Wheat Harvest Scheme whether the suggestion was practicable.

#### BRAN.

Mr. Dawkins raised the question of the difficulty experienced by producers in securing supplies of bran. It was pointed out that practically all the flour mills in the State were working, but nevertheless there appeared to be very little bran available. It was decided to direct the attention of the Minister of Agriculture to this matter, with a request that steps should be taken in order to ascertain the cause of the apparent shortage.

#### SEED INSPECTION.

On the motion of Mr. Dawkins, it was decided to recommend to the Hon. the Minister of Agriculture that the same facilities for the protection of the State against the importation of weed seeds from abroad should be afforded against weed seeds imported from other States.

#### LIFE MEMBERS.

The name of Mr. E. Chapman, of the Green Patch Branch, and Mr. W. J. Stone, of the Meadows Branch, were added to the list of life members.

#### NEW BRANCH.

Approval was given to the formation of a new Branch at Wudinna, and the Branch at Arden Vale and Wyacca was closed.

#### NEW MEMBERS.

The following names were added to the rolls of existing Branches:—Cherry Gardens—E. J. Hosking; Koonibba—Herb. Schroeder, D. P. Thisleton, H. E. Gersch, J. F. Handtke, A. Bode, T. Nickel, jun.; Miltalie—H. Bagnell; Mount Remarkable—R. W. Cope, B. J. Heard, Wm. Ledgard, C. H. Pengilly; Clare—M. Vogt; Port Germein—R. G. Campbell; Inman Valley—J. J. Lee, A. T. Grosvenor, Jos. Lan, W. G. Millard; Glencoe—G. E. Northern, H. Holloway; Beetaloo Valley—E. A. Pearce; Wirrabara—J. F. W. Roocke; Salisbury—E. Jones; Kybybolite—P. A. Laurie; Mallala—C. Temby; Berri—F. R. Clark; Bundaleer Springs—A. Dempsey, H. T. Laurie; Meribah—S. H. Pavy, W. H. Muller; Mintaro—G. Ashby; Lenswood and Forest Range—A. Mason; Dowlingville—J. F. Whittaker, C. A. Hall; Gawler River—W. F. Leak; Renmark—J. N. Johnson, G. Haywood, F. Kurtz; Watervale—J. Gare, W. Hunter; Mundalla—G. A. Dinning.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on May 1st, 1918:—

**BUTTER.**—Since our last report fair downpours have been experienced in some parts of the country, and in fact the conditions in the North-East are said to be favorable now. However, it is to be hoped that ere long general and heavy rains will be recorded. In the meanwhile local production has further decreased, so that the quantities coming forward from the eastern States are greater than a month ago. There is no change in factory values, "Alfa" being 1s. 7d.; "Primus," 1s. 6½d.; second grade creamery, 1s. 3d.; third grade, 1s. 2d.; choice separators and dairies, 1s. 4d. to 1s. 5d.; fair quality, 1s. 2½d. to 1s. 3½d.; store and collectors', 1s. 1d. to 1s. 3d. per lb.

**EGGS.**—Eggs are in very short supply, and no doubt the absence of green feed has further accentuated this condition. Refrigerated and pickled eggs are still coming to hand, but nevertheless throughout the month fresh hen advanced to 1s. 7d.; duck, 1s. 8d. per dozen; refrigerated lots, 1s. 3½d. to 1s. 4d.; well preserved, 10½d. to 11d. per dozen.

**CHEESE.**—Stocks held by the South-Eastern factories are on the light side, and quantities coming forward are placed locally, with no surplus available for export. Prices are right up to proclaimed rates, viz., matured, 10½d. to 11d.; new make, 9d. to 9½d. per lb. for large to loaf.

**HONEY.**—Values have eased somewhat owing to the scarcity of freight, buyers being disinclined to operate very freely. Prime clear extracted selling at 4½d.; second grades, 3d. to 3½d.; beeswax wanted at 2s. per lb.

**ALMONDS.**—The high prices have not interfered with sales, many export orders not having been completed. Brandis, 1s. 4d.; mixed softshells, 1s. 3d.; hardshells, 10d.; kernels, 2s. per lb.

**BACON.**—Curers have been able to send on increasing quantities, but market has been kept fairly clear owing to good export and local trade ruling. Best factory-cured sides, 11½d. to 1s.; hams, 1s. 1d. to 1s. 2d. per lb.; farm-cured lots have no inquiry.

**LIVE POULTRY.**—Heavy pennings have been catalogued during the month, but under keen competition values have kept up remarkably well for quality lots, poor and light sorts selling according to condition. Heavy-weight table roosters realised 3s. 3d. to 4s. 6d. each; nice-conditioned cockerels, 2s. 5d. to 3s.; plump hens, 1s. 9d. to 3s. 9d.; light sorts, 1s. 5d. to 1s. 8d.; ducks, 1s. 7d. to 2s. 8d.; geese, 3s. 6d. to 4s. 6d.; pigeons, 4d. to 4½d.; turkeys, 8d. to 9½d. per lb. live weight for fair to good table birds.

**POTATOES.**—Digging in the Millicent district has commenced in earnest, with the result that South-Eastern supplies have appreciably increased. Dealers in the Gippsland district, Victoria, have also displayed considerable anxiety to sell on the Adelaide market, and in consequence prices have steadied. **ONIONS.**—Growers at Mount Gambier are not disposed to sell, and during the past month Adelaide has bought chiefly from Victoria. Prices—Potatoes, £5 to £6 per ton; onions, £12 per ton, on trucks Mile End or Port Adelaide.



## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF APRIL.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

*Eyre's Peninsula.*—The weather has been fine and seasonable. A good fall of 76 points rain fell early in the month, followed by fine conditions with south and east breezes. Light scattered showers were received towards the close of the month. Altogether rather more rain than the average has been registered for the month. Crops—Very little seed has yet been sown, but good areas have been ploughed and cultivated ready for the drill. Natural Feed—Self-sown and natural grasses have germinated, and will soon give a fair picking of green to stock. Stock—Some digestive troubles have occurred amongst the horses of the district, principally due to the long-continued spell of dry feeding. Pests—Rabbits have again lost heavily, and they are now not much in evidence in the immediate neighborhood.

*Kybybolite.*—Weather—The long dry spell continued throughout this month until the 25th instant, but during the next few days a very useful fall of rain was experienced, and perfect conditions now prevail for the work in hand. A fair area of crop was dry sown, but as the rains have just fallen, none of it is up. Ploughing is in full swing now that rain has fallen, and seeding work will be hurried along. Natural Feed—Only dry feed available, and this is of little value. Stock are generally fair to poor. Hand-feeding has been pretty general, with sheep, and absolutely necessary for larger stock. Ewes in some instances are too weak to rear early lambs, and there is likely to be some loss in this way as the effect of the rains will not be felt for a few weeks. Early lambs are being dropped.

*Turretfield.*—Weather—There was no outstanding feature in the weather experienced during April. Cool autumn conditions prevailed, but there was not much rain. The total recorded for the month was 72 points, of which 55 fell during the last week. Crops—Towards the end of the month farmers took advantage of the light rain to plough the land as deeply as circumstances would permit, in order to get some barley sown for early green feed. Natural Feed—Dry feed has gone off considerably during the past month. The rain has started the germination of the grass, which is everywhere lifting the surface soil. Stock—Horses and cattle are keeping in fair condition. Some losses are reported amongst the flocks of sheep, more especially amongst the ewes in lamb. A change of pasture appears to have the effect of checking any serious development. Lambing is becoming general. Pests—Rabbits are fairly numerous, and foxes are also prevalent. The latter pest will be somewhat difficult to deal with owing to the high price and scarcity of strychnine. Miscellaneous—The water in the North Para has been freshened by the recent rain.

*Veitch.*—Weather—Very dry weather has been experienced at Veitch during the first three weeks of the present month, with a good fall of rain on the 24th and 25th; rainfall for month, 100 points; Veitch average for same month, 28 points. Crops—Seeding operations are in progress on many farms in this district, and the ground is in good condition for drilling purposes after the late fall of rain. Natural Feed—Dry scrub feed is available, but stubble feed has all dried off. Stock—All stock in healthy condition. Pests—Rabbits are numerous, and are being dealt with.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of April, 1918, also the average precipitation to the end of April, 1918, and the average annual rainfall.

Station.	For April, 1918.	To end April, 1918.	Av'ge. to end April.	Av'ge. Annual Rainfall	Station.	For April, 1918.	To end April, 1918.	Av'ge. to end April.	Av'ge. Annual Rainfall
<b>FAR NORTH AND UPPER NORTH.</b>					<b>LOWER NORTH—continued.</b>				
Dodnadatta .....	0-08	1-03	2-06	4-76	Spalding .....	1-73	4-35	3-17	20-25
Faroola .....	0-27	3-74	1-52	7-58	Gulnare .....	1-25	3-28	2-80	19-74
Marree .....	0-13	1-27	1-88	6-04	Bundaleer W. Wks.	1-86	5-03	2-90	17-29
Parina .....	0-85	1-55	2-07	6-70	Yacka .....	1-23	2-49	2-99	15-27
Leigh's Creek .....	0-34	1-15	2-43	8-66	Koolunga .....	1-17	2-15	3-25	15-94
Beltana .....	0-31	1-40	2-76	9-22	Snowtown .....	1-23	1-90	3-19	15-70
Blinman .....	1-55	2-73	3-46	12-83	Brinkworth .....	1-62	3-61	2-76	15-48
Hookina .....	0-25	1-20	1-67	—	Blyth .....	1-15	2-69	3-50	16-34
Hawker .....	0-52	2-02	2-39	12-22	Clare .....	2-07	4-11	4-80	24-30
Wilson .....	0-44	0-84	2-47	11-78	Mintaro .....	1-90	3-83	3-89	21-99
Gordon .....	0-32	4-10	1-91	10-26	Watervale .....	1-77	3-49	5-32	27-17
Quorn .....	0-34	4-06	2-36	13-78	Auburn .....	1-67	3-54	4-93	24-25
Port Augusta .....	0-29	2-41	2-39	9-46	Hoyleton .....	1-01	2-24	3-80	17-96
Port Augusta W. ..	0-27	2-48	2-14	9-36	Balaklava .....	1-64	3-25	3-55	16-03
Bruce .....	0-28	2-29	1-89	10-01	Port Wakefield ..	0-65	1-90	3-36	13-13
Hammond .....	0-29	2-36	2-57	11-46	Terowie .....	1-35	2-68	2-09	13-71
Wilmington .....	0-54	4-22	3-50	18-26	Yarcowie .....	2-17	4-55	3-06	13-91
Willowie .....	0-79	2-10	2-28	11-90	Hallett .....	1-71	2-92	3-15	16-40
Malrose .....	1-09	4-78	4-76	23-04	Mount Bryan ..	1-29	2-26	2-81	15-73
Booleroo Centre ..	1-28	3-63	3-10	15-83	Burra .....	2-26	3-37	3-60	17-82
Port Germein .....	0-55	4-31	2-91	12-84	Farrell's Flat .....	2-06	2-96	3-75	18-87
Wirrabara .....	1-83	3-29	3-72	18-91	<b>WEST OF MURRAY RANGE.</b>				
Appila .....	1-13	2-88	3-35	15-08	Manoora .....	2-12	3-88	3-48	18-09
Cradock .....	0-40	0-89	2-31	10-86	Saddleworth .....	1-69	3-52	4-24	19-69
Carrieton .....	0-48	2-00	2-46	12-22	Marrabel .....	1-83	3-56	3-92	18-94
Johnburg .....	1-19	2-57	2-02	10-21	Riverton .....	2-11	3-42	4-33	20-48
Eurelia .....	0-99	2-68	2-67	13-24	Tarlee .....	1-39	3-09	3-92	17-48
Orroroo .....	1-21	2-94	3-14	13-42	Stockport .....	0-97	2-23	3-65	15-89
Black Rock .....	0-93	2-55	2-84	12-25	Hamley Bridge ..	1-12	2-23	3-77	16-45
Peterborough .....	1-38	2-75	3-00	13-07	Kapunda .....	1-35	3-17	4-32	19-67
Yongala .....	1-35	3-08	2-63	13-94	Freeling .....	1-12	2-72	3-97	17-85
<b>NORTH-EAST.</b>					Greenock .....	1-61	3-16	4-38	21-46
Ucoita .....	1-40	3-27	0-94	—	Truro .....	2-64	4-59	4-04	19-74
Nackara .....	1-39	3-54	1-98	—	Stockwell .....	3-03	4-68	4-12	20-30
Yunta .....	1-11	2-19	2-12	8-22	Nuriootpa .....	1-67	3-25	4-21	21-25
Waukaranga .....	1-10	2-97	1-96	7-94	Angaston .....	2-32	3-92	4-38	22-25
Mannahill .....	0-93	2-99	2-25	8-46	Tanunda .....	1-23	3-22	4-49	22-28
Cockburn .....	0-97	2-39	2-17	7-97	Lyndoch .....	0-84	2-06	4-33	23-01
Broken Hill, NSW	1-64	3-81	2-65	9-63	Williamstown ..	1-17	2-65	5-00	—
<b>LOWER NORTH.</b>					<b>ADELAIDE PLAINS.</b>				
Port Pirie .....	0-64	3-41	3-08	13-21	Mallala .....	0-90	1-78	3-67	16-88
Port Broughton ..	0-93	1-73	3-14	14-33	Roseworthy .....	0-72	1-86	3-95	17-31
Bute .....	0-94	1-90	3-16	15-42	Gawler .....	0-64	1-60	4-15	19-21
Laura .....	1-45	2-56	3-54	18-22	Two Wells .....	0-77	1-46	3-61	16-36
Caltowie .....	1-48	3-23	3-37	17-27	Virginia .....	0-95	2-02	3-79	17-58
Jamestown .....	1-75	3-35	3-39	17-46	Smithfield .....	0-51	1-64	3-62	17-30
Gladstone .....	1-29	3-58	3-30	16-00	Salisbury .....	0-92	2-39	4-09	18-57
Crystal Brook .....	1-26	2-66	3-26	15-62	North Adelaide ..	1-15	2-31	4-38	21-49
Georgetown .....	1-39	3-50	3-76	18-32	Adelaide .....	0-88	1-95	4-26	21-04
Narridy .....	1-29	2-50	3-44	16-79	Brighton .....	1-04	2-73	4-04	—
Redhill .....	1-43	2-50	3-35	16-79	Glenelg .....	0-85	2-01	3-85	—
					Magill .....	1-06	2-44	5-13	19-93

## RAINFALL—continued.

Station.	For April, 1918.	To end April, 1918.	Av'ge. to end April.	Av'ge. Annual Rainfall	Station.	For April, 1918.	To end April, 1918.	Av'ge. to end April.	Av'ge. Annual Rainfall
ADELAIDE PLAINS—continued.					WEST OF SPENCER'S GULF—continued.				
Glen Osmond . . .	1.41	3.12	5.03	25.26	Talia . . . . .	0.41	1.35	1.65	—
Mitcham . . . . .	1.19	2.49	4.59	23.47	Port Elliot . . .	0.52	1.31	2.50	16
Belair . . . . .	1.58	2.89	5.58	28.64	Port Lincoln . . .	0.57	1.32	3.53	19
MOUNT LOFTY RANGES.					Tumby Bay . . . .	0.47	1.28	2.66	15
Teatree Gully . . .	1.64	3.36	5.50	28.19	Carrow . . . . .	0.61	1.14	—	—
Stirling West . . .	2.15	4.49	8.49	46.70	Cowell . . . . .	0.94	1.94	3.04	11
Uraidla . . . . .	2.88	5.44	8.09	44.35	Point Lowly . . .	0.41	2.37	2.59	12
Clarendon . . . . .	1.42	3.83	6.52	33.67	Cummins . . . . .	0.48	1.14	—	—
Morphett Vale . . .	0.81	2.84	4.76	23.32	Arno Bay . . . . .	0.79	1.33	2.75	—
Noarlunga . . . . .	0.59	2.40	4.06	20.28	YORKER'S PENINSULA.				
Willunga . . . . .	1.31	3.09	4.80	25.98	Wallaroo . . . . .	1.08	2.71	3.25	144
Aldinga . . . . .	0.70	2.17	3.99	20.34	Kadina . . . . .	0.99	2.70	3.41	154
Normanville . . . .	0.86	1.38	3.90	20.65	Moonta . . . . .	0.72	2.56	3.45	154
Yankalilla . . . . .	1.12	1.70	4.46	22.78	Green's Plains . .	1.12	2.42	3.06	157
Cape Jervis . . . .	—	—	2.92	16.34	Maitland . . . . .	1.16	2.46	3.91	200
Mount Pleasant . .	1.37	2.92	4.97	26.87	Androssan . . . .	0.54	2.08	2.92	134
Birdwood . . . . .	1.17	2.58	5.36	29.38	Port Victoria . . .	0.82	1.43	3.05	164
Gumeracha . . . . .	2.07	4.48	5.89	33.30	Curramulka . . . .	0.54	1.34	3.50	184
Tweedvale . . . . .	2.01	4.05	5.97	35.38	Minlaton . . . . .	0.50	1.45	3.34	174
Woodside . . . . .	1.93	4.16	5.45	31.87	Stansbury . . . . .	0.31	0.76	3.33	170
Ambleside . . . . .	1.74	3.69	6.06	35.45	Warooka . . . . .	0.71	1.54	3.01	177
Nairne . . . . .	1.64	3.37	5.53	28.83	Yorketown . . . . .	0.49	1.47	3.14	174
Mount Barker . . .	2.10	4.16	5.67	30.93	Edithburgh . . . .	0.62	1.37	3.34	164
Echunga . . . . .	2.16	4.49	6.18	32.83	SOUTH AND SOUTH-EAST.				
Macclesfield . . . .	1.90	4.01	5.78	30.72	Cape Borda . . . .	0.69	1.47	4.18	250
Meadows . . . . .	2.49	4.51	6.92	35.52	Kingscote . . . . .	0.75	1.74	3.32	180
Strathalbyn . . . .	1.10	2.16	3.98	19.28	Penneshaw . . . . .	0.53	1.14	3.85	213
Myponga . . . . .	1.23	3.18	—	—	Cape Willoughby . .	—	—	3.73	194
Millbrook Reservr.	2.55	4.93	—	—	Victor Harbor . . .	0.73	2.06	4.28	221
MURRAY FLATS AND VALLEY.					Port Elliot . . . .	0.90	3.12	4.03	203
Wellington . . . . .	0.88	1.97	3.57	15.01	Goolwa . . . . .	0.86	2.13	3.80	170
Milang . . . . .	0.67	2.76	3.47	16.08	Pinnaroo . . . . .	1.67	3.56	3.12	167
Langhorne's Brdg . .	0.59	1.37	3.27	15.27	Parilla . . . . .	1.32	2.60	—	—
Tailem Bend . . . .	1.25	2.56	3.06	—	Lameroo . . . . .	1.44	3.01	3.27	166
Murray Bridge . . .	0.77	1.76	3.45	14.32	Parrakie . . . . .	1.00	1.96	2.50	—
Callington . . . . .	0.72	1.90	3.48	15.65	Geranium . . . . .	1.90	2.34	3.20	—
Mannum . . . . .	1.10	1.60	2.96	11.67	Peake . . . . .	1.08	1.98	3.39	—
Palmer . . . . .	0.81	1.46	3.19	15.60	Cooke's Plains . . .	1.14	2.07	3.22	147
Sedan . . . . .	0.74	2.05	2.72	11.92	Meningie . . . . .	0.86	2.23	3.78	—
Blanchetown . . . .	1.82	2.88	2.70	—	Coomandook . . . .	0.96	1.97	3.23	168
Eudunda . . . . .	3.46	4.50	3.57	17.33	Coonalpyn . . . . .	0.94	2.34	3.62	174
Sutherlands . . . . .	2.64	3.59	1.96	10.71	Tintinara . . . . .	1.38	2.44	3.74	187
Morgan . . . . .	1.26	1.73	2.16	10.60	Keith . . . . .	0.89	1.99	3.40	—
Overland Corner . .	0.59	1.09	2.87	—	Bordertown . . . .	1.24	2.32	3.89	197
Renmark . . . . .	0.79	3.45	2.50	11.42	Wolsley . . . . .	1.00	2.36	2.60	177
Loxton . . . . .	0.65	1.51	1.79	10.93	Frances . . . . .	1.10	2.20	2.88	207
Swan Reach . . . . .	0.93	1.64	2.30	—	Naracoorte . . . . .	1.00	2.04	4.91	22.6
Waikerie . . . . .	1.00	2.10	2.10	—	Penola . . . . .	1.19	2.32	5.16	25.7
WEST OF SPENCER'S GULF.					Lucindale . . . . .	0.73	1.50	4.27	23.3
Eucla . . . . .	0.12	3.08	3.26	10.13	Kingston . . . . .	0.18	1.27	4.46	24.7
White Well . . . . .	0.58	1.04	2.06	9.67	Robe . . . . .	0.19	1.20	4.39	24.6
Fowler's Bay . . . .	0.52	1.25	2.27	12.13	Beachport . . . . .	0.62	1.52	5.16	27.5
Penong . . . . .	0.56	1.00	2.43	11.91	Millieent . . . . .	0.83	2.17	5.63	29.2
Murat Bay . . . . .	0.50	1.42	1.18	—	Mount Gambier . . .	1.03	2.36	6.51	32.0
Smoky Bay . . . . .	0.49	0.97	—	—	C. Nrthumberland .	—	—	5.15	26.6
Streaky Bay . . . .	0.52	1.12	2.62	15.31	Kalangadoo . . . .	0.84	2.36	—	—

## AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		May.	June.			May.	June.
Amyton .....	817	—	—	Forster .....	*	—	—
Angaston .....	*	—	—	Frances .....	*	—	—
Appila-Yarrowie .....	*	—	—	Freeling .....	*	23	20
Artherton .....	*	—	—	Gawler River .....	820	27	24
Ashbourne .....	834	27	24	Georgetown .....	*	—	—
Balaklava .....	*	—	—	Geranium .....	*	26	29
Beaufort .....	*	—	—	Gladstone .....	*	—	—
Beetaloo Valley .....	819	20	—	Glencoe .....	†	—	—
Belalie North .....	*	26	22	Glencope .....	*	—	—
Borri .....	*	29	26	Goode .....	*	—	—
Blackheath .....	†	26	22	Green Patch .....	823	—	—
Blackwood .....	834	20	17	Gumeracha .....	*	24	28
Blyth .....	*	—	—	Halidon .....	*	—	—
Bookpurnong East .....	*	—	—	Hartley .....	†	—	—
Booleroo Centre .....	819	24	21	Hawker .....	*	28	26
Borrika .....	834	—	—	Hilltown .....	*	—	—
Bowhill .....	*	—	—	Hookina .....	817	21	18
Brentwood .....	823	23	20	Inman Valley .....	*	—	—
Brinkley .....	826	—	—	Ironbank .....	*	—	—
Bundaleer Springs .....	†	—	—	Julia .....	*	—	—
Burra .....	*	—	—	Kadina .....	*	—	—
Bute .....	*	—	—	Kalangadoo .....	*	11	8
Butler .....	*	—	—	Kanmantoo .....	838	26	22
Caltowie .....	*	—	—	Keith .....	*	—	—
Canowie Belt .....	*	—	—	Ki Ki .....	*	—	—
Carrieton .....	817	—	—	Kingscote .....	*	—	—
Carrow .....	*	—	—	Kingston-on-Murray .....	*	—	—
Cherry Gardens .....	838	21	18	Kongorong .....	840	21	18
Clanfield .....	834	—	—	Koonibba .....	823	23	20
Clare .....	*	—	—	Koppio .....	*	7	4
Clarendon .....	*	—	—	Kybybolite .....	840	25	20
Claypan Bore .....	*	—	—	Lameroo .....	829	—	—
Colton .....	†	—	—	Laura .....	*	17	14
Coomandook .....	834	—	—	Leighton .....	*	—	—
Coomoore .....	*	—	—	Lenswood and Forest Range .....	*	—	—
Coonalpyn .....	826	2, 24	21	Lone Pine .....	821	—	—
Coonawarra .....	839	—	—	Longwood .....	836	—	—
Coorabie .....	*	—	—	Loxton .....	*	—	—
Cradock .....	*	—	—	Lucindale .....	*	—	—
Crystal Brook .....	*	—	—	Lyndoch .....	*	—	—
Cummins .....	*	26	22	MacGillivray .....	837	—	—
Cygnat River .....	836	23	20	Maitland .....	*	—	—
Davenport .....	*	—	—	Mallala .....	821	13	10
Dawson .....	*	—	—	Mangalo .....	*	—	—
Denial Bay .....	*	—	—	Mantung .....	*	—	—
Dowlingville .....	†	—	—	Meadows South .....	838	21	18
Edillilie .....	*	—	—	Menangle .....	*	—	—
Elbow Hill .....	*	—	—	Meribah .....	829	—	—
Eurelia .....	*	—	—				

## INDEX TO AGRICULTURAL BUREAU REPORTS—continued.

Branch	Report on Page	Dates of Meetings.		Branch	Report on Page	Dates of Meetings.	
		May.	June.			May.	June.
Milang .....	†	11	8	Port Garmein .....	*	—	—
Millicent .....	*	14	11	Port Pirie .....	*	25	22
Miltalie .....	*	25	22	Quorn .....	818	25	22
Mindarie .....	*	6	3	Ramco .....	†	20	—
Minlaton .....	†	17	14	Redhill .....	820	—	—
Minnipa .....	824	—	—	Renmark .....	*	—	—
Mintaro .....	819	25	22	Riverton .....	*	—	—
Mitchell .....	*	—	—	Riverton (Ladies') ..	*	—	—
Monarto South .....	830	—	—	Roberts and Verran ..	*	—	—
Moonta .....	823	—	—	Rosedale .....	822	22	19
Moorlands .....	*	—	—	Rosey Pine .....	*	—	—
Morehard .....	813	25	22	Saddleworth .....	822	25	22
Morgan .....	830	—	—	Salisbury .....	822	—	—
Morphett Vale .....	†	—	—	Salt Creek .....	†	—	—
Mount Barker .....	*	22	19	Sandalwood .....	*	—	—
Mount Bryan .....	*	—	—	Sherlock .....	*	—	—
Mount Bryan East ..	*	—	—	Spalding .....	*	—	—
Mount Compass .....	*	—	—	Stockport .....	*	—	—
Mount Gambier .....	*	11	8	Strathalbyn .....	838	21	18
Mount Hope .....	*	25	—	Sutherland .....	*	—	—
Mount Pleasant .....	*	—	—	Talia .....	826	11	8
Mount Remarkable ..	818	15	12	Tantanoola .....	840	4	1
Mundalla .....	†	22	19	Tarcowie .....	818	21	18
Mundoorra .....	820	—	—	Tatiara .....	*	4	1
Murray Bridge .....	†	21	18	Tintinnarra .....	*	—	—
Myponga .....	830	—	—	Two Wells .....	*	—	—
Myrta .....	*	—	—	Uraidla and Summert'n	†	6	3
Nantawarra .....	†	—	—	Waikerie .....	†	17	26
Naracoorte .....	*	—	—	Warcoowie .....	*	—	—
Narriby .....	*	—	—	Warrow .....	*	—	—
Narrung .....	*	—	—	Watervale .....	822	—	—
Netherton .....	834	—	—	Wepowie .....	818	25	22
North Booborowie ..	*	—	—	Whyte-Yarcowie .....	820	20	15
North Bundaleer .....	*	—	—	Wilkawatt .....	833	—	—
Northfield .....	*	7	4	Willowie .....	*	21	18
Nunkei and Yurgo ..	832	—	—	Wilmington .....	818	—	—
O'Loughlin .....	825	22	19	Wirrabara .....	*	—	—
Orroroo .....	*	—	—	Wirrega .....	*	—	—
Parilla .....	*	—	—	Wolawa .....	834	—	—
Parilla Well .....	*	—	—	Woodleigh .....	*	—	—
Parrakie .....	*	—	—	Woodside .....	*	—	—
Paskeville .....	*	—	—	Wynarka .....	834	—	—
Penola .....	*	—	—	Yabmana .....	*	—	—
Penong .....	†	11	8	Yacka .....	*	—	—
Petina .....	*	—	—	Yadnarie .....	826	—	—
Pine Forest .....	*	—	—	Yallunda .....	*	—	—
Pinnaroo .....	834	—	—	Yaninee .....	826	—	—
Pompoona .....	*	1, 15, 29	5	Yeelanna .....	*	—	—
Port Broughton .....	†	—	—	Yongala Vale .....	†	24	21
Port Elliot .....	838	18	15	Yorketown .....	*	—	—

\* No report received during the month of April.

† Formal report only received.

‡ Held over until next month.

## THE AGRICULTURAL BUREAU.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

##### (PETERBOROUGH AND NORTHWARD.)

AMYTON (Average annual rainfall, 11.82in.).

March 26th.—Present: 12 members and four visitors.

EXPERIMENTAL PLOTS.—Mr. T. Griffen initiated a discussion on the experimental plots at Hammond, and explained the objects and the advantages to be derived from them. A discussion also took place on the "Wheat Standards."

CARRIETON (Average annual rainfall, 12.22in.).

March 20th.—Present: five members.

MACHINE SHEARING.—A paper on this subject was contributed by Mr. S. Manning, and read by the Hon. Secretary (Mr. T. H. Fuller). Mr. Manning pointed out that the scarcity of labor and the increasing cost of shearing were two of the main factors that induced him to instal machines for shearing. Although he had had only a short experience with the machines he was well pleased with the work they performed. He considered the machines were faster than the blades, and, provided the combs and cutters were kept sharp, he did not think they were so rough on the sheep. Another important item he had noticed was that since he had used the machines the trouble with the maggot fly had not been nearly so great. The effect on the sheep after being shorn was very much the same—they did not appear to suffer from the cold to any great extent. He had turned a number of sheep out during last August, during which month snow fell, and not a single sheep had been lost. The meeting then discussed at length the question of "Compulsory Dipping of Sheep."

HOOKINA (Average annual rainfall, 12in.).

March 26th.—Present: nine members.

SEEDING OPERATIONS.—Mr. C. F. Stone, who initiated a discussion on this topic, advised the recleaning of all seed wheat early in the season in order to save time during the busy season. Grading was also beneficial, as the plump grain would hold out much better during dry weather. Clean fallow land could be sown early, but if possible stubble land should not be attempted until rain had fallen. All seed wheat, whether smutty or not, should be pickled. He did not think that sowing with the drill was responsible for an increase in smut. The use of the drill was always preferable to broadcasting, because the seed was sown to an even depth, and the crop was able to stand the rough weather much better. The time for seeding depended on climatic conditions, but for that district the middle of April was a suitable time. The seed should be sown about 2in. deep. King's Early, Federation, and Bluey were good varieties to sow. Mr. G. Henschke said it was a good plan when sowing solely for hay to mix several varieties of wheat and drill them in together. Mr. Murphy favored commencing seeding during the first week in April, but would not sow on stubble land until rain had fallen.

TARCOWIE (Average annual rainfall, about 15 in.).

March 28th.—Present: 17 members and three visitors.

**TREATMENT OF THE FARM MARE.**—Mr. H. Edwards, in a paper on this question, said two lines of profit were derived from the use of specially selected farm mares, namely, the rearing of colts and fillies and the work they did on the farm. To secure a maximum result from that system all the animals used for farm work should be brood mares. The colts or geldings could be sold at that stage at which they would return a reasonable profit, as also could those mares which did not throw a good foal. By that plan the number of horses would be increased, and the quality of the farmers' horses would soon improve. In selecting a mare for breeding purposes one should consider the following points:—Sound constitution; quiet disposition, clean flat bone, be well proportioned, deep, roomy barrel, width across the hips, and good teats. It should be remembered that by making the mare assist in the work of the farm, besides rearing a foal, she should have extra food, care, and attention. The mare would have a better time during foaling if she was worked close up to the foaling period than if allowed to spell for a long time beforehand. A fortnight after foaling the mare should be able to do light work. He did not think it advisable to allow the foal to follow the mare in the team. It was essential that the mare, whilst rearing the foal, should have plenty of good food such as sweet hay chaff and a liberal supply of bran, with a few oats. The services of the best stallion in the district should be procured, and even if the fee was high it would pay in the long run. He preferred putting the horse to the mares on the ninth or tenth day after foaling if possible, even though that meant they would foal very early, because they were harder to get in foal if not served at that time. If the fillies were well grown at three years he endeavored to get them in foal at that age, because as a rule they made better brood mares. The foal should not be weaned until at least five months old, when it should be hand fed, until there was plenty of good green feed in the paddocks. Unless that was done one could not expect the foal to develop into a good, robust horse. Providing the above points were followed he thought the horse could be broken in at two years old.

WILMINGTON (Average annual rainfall, 18.26 in.).

March 27th.—Present: 10 members.

**BEST VARIETY OF WHEAT FOR HAY AND STACK-BUILDING.**—In a short paper on this question Mr. Zimmermann said he preferred Marshall's No. 3 for a good average yield, but where the ground was at all dirty he sowed Riverina Purple Straw and Cape oats mixed, which made an excellent hay crop. For loose hay feeding the best time to cut was a week after the wheat had blossomed, but for chaffing, to get weight and strength he preferred to see the straw slightly turn yellow. To get good-colored hay the sheaves should be stooked behind the binder. It could then be left for about three weeks before being carted. He used timber for dunnage for stack-building, and then covered that with a good thick layer of straw. When stack-building the sheaves should be crossed at each corner, and the sheaves of the walls laid on their edges. That kept the walls straight from corner to corner. Next time that plan could be reversed. The middle of the stack should be doubled every round. In opening the discussion, Mr. Goodenough pointed out that he preferred cutting one stack of green hay and another of riper quality. The two mixed made excellent loose feeding hay, and when chaffed were of greater commercial value. All agreed with King's Red, Marshall's, and Jacobs' being good hay for loose feeding, but there was a fair division in discussing the safest way to place sheaves to prevent rain penetrating, viz., either heads of sheaves or butt ends outwards.

**MORCHARD, March 23rd.**—Mr. E. J. Kitto contributed a paper on the subject of "The Outlook of Agricultural Industry."

**MOUNT REMARKABLE, April 17th.**—The Poultry Expert (Mr. D. F. Laurie) delivered an address on the "Breeding, Housing, and Feeding of Poultry" to a large attendance of members.

**QUORN, March 22nd.**—The meeting took the form of a discussion on the question of "Standards of Super."

**WEPOWIE, April 6th.**—Mr. J. E. Pearce read a paper on "Mixed Farming," which was well discussed.

## MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

March 27th.—Present: nine members and two visitors.

BLACKSMITH SHOP ON THE FARM.—In a short paper on this question Mr. C. Cox said that with a blacksmith shop and a set of tools on the farm one would be able to do odd jobs and light repairs, and so save a good deal of time and expense during busy seasons. A short paper was also contributed by Mr. J. Ryan on the question of "Growing and Planting Vines." He said the land should be selected so that the rays of the morning sun would fall upon it. It should also be of a sandy nature, and to obtain the best results it must be well worked. When planting, the holes should be dug about 1ft. deep and 10ft. apart to allow for the working of the plough. He had found it a good plan to put about 6in. of loose soil in the hole before planting the vine.

BOOLEROO CENTRE (Average annual rainfall, 15.83in.).

March 22nd.—Present: 14 members.

DESTRUCTION OF NOXIOUS WEEDS.—Since the year 1914, when a drought was experienced practically throughout the whole of South Australia, said Mr. G. R. Hein in a paper dealing with the destruction of noxious weeds, many weeds had made their appearance. He was quite aware that it was not possible to eradicate the weeds in one or even more seasons, but he considered that farmers should, when the opportunity presented itself, destroy as many weeds as possible. He had found it a good plan when riding after stock to carry a hoe. If that was done any doubtful weeds that were noticed could be destroyed. He thought that wild turnip was a very bad weed. When eaten by sheep it gave the mutton a bad flavor, and it also had a bad effect on milk and butter. Again, during harvest time considerable trouble was experienced in reaping a crop in which wild turnip was growing, as the weed was very brittle when dry, and caused the harvester to choke. Another weed that caused trouble was the star thistle. If a crop had very many of those plants in it, and it was cut for hay, it would be almost impossible to chaff it on account of the very sharp prickles.

## MINTARO.

October 27th.—Present: 10 members and 10 visitors.

HOMESTEAD MEETING.—The monthly meeting of the Branch was held at the homestead of Mr. J. Thomas. The State Viticulturist (Mr. H. E. Laffer) attended the meeting and delivered an address on "The Farm Garden." Some very fine samples of preserved fruits were tabled by Mrs. Thomas, which were very favorably commented upon by Mr. Laffer.

## MINTARO.

November 24th.—Present: 18 members and two visitors.

PREPARING FOR THE HARVEST.—Mr. A. L. Sandow, who contributed a paper on this subject, said that unless a careful preparation was made for harvesting operations a considerable amount of lost time would occur. As the combined harvesters were the machines commonly used for saving the harvest it was of vital importance that they should be in thorough working order. In the first place the comb of the machine, if showing the worse for wear or too open, should be relaid or closed up. The beaters being another important part should have a good sharp edge on them. If they were worn it was a good plan to reverse them and rivet them on the other side of the spider, thus again getting a good keen edge for beating off the heads, and at the same time considerably decreasing the draught of the machine. A season such as last year necessitated good sharp-edged beaters on account of the dull weather and tangled crops, and it also helped to decrease the choking. If the harvester had belt-driven elevators he recommended farmers to put leather on all the pulleys, which made a splendid purchase for the revolving belts to grip, and consequently the belts could be driven much slacker, again reducing the draught. A common occurrence which was often complained of, perhaps more particularly amongst the older harvesters, was the heaviness of the rack for lifting the comb up and down. A plan which proved satisfactory was a piece of chain or hoopiron



running from the back of the off side corner up underneath the screw rack, and run through a pulley on to where the horses were connected. As the comb was adjusted downwards the horses would help to pull it up. In the preparation for harvest a little consideration of the following points should be given at seed time. In the case of wanting to grow a portion of Yandilla King wheat or any other tough varieties a good plan was to have a portion of Federation, or some other easy-threshing wheat in the same paddock, where one could go on reaping until the day warmed sufficiently for the tougher wheats to thresh well. Another point which paid for the attention given it was the wetting of the cornsacks and letting them dry in the sun for several days before filling. By that process the bags stretched, and would hold very much more wheat, a very important thing at the present price of bags. In the case of running short of bags, and the sewing getting in arrears, a good idea to make the bags last out was to use a manure bag, about one in every 10, or as near as whatever was likely to be thrown out in the sewing. By that plan there would not be many good bags emptied after the sewing. The wheat should be carted immediately to market, even if it were found necessary to hire a team. No risks were then taken of damage by fire and floods, and at the same time the wheat would be marketed without losing weight in the paddocks.

#### REDHILL (Average annual rainfall, 16.79in.).

November 27th, 1917.—Present: 10 members and three visitors.

CO-OPERATION—SHEEP DIP.—Mr. H. Torr, in introducing the discussion, dealt with lice and tick found by the farmers in their sheep in that district. He had received much useful information from the Riverton Branch of the Agricultural Bureau, where they had installed a sheep dip on co-operative lines. Mr. R. Lines said every sheep owner should dip his sheep. Lice were transferred by means of rails at saleyards from one flock to another. He did not favor a public co-operative sheep-dipping bath, but thought that four or five farmers should co-operate and buy a small sheep-dipping bath amongst themselves. Mr. Stone thought a public sheep dip would be all right for travelling sheep if they happened to be in the vicinity of the sheep bath when vermin was detected amongst them. Mr. MacAvaney said dipping sheep improved the wool. Mr. Coffey said dipping sheep was very effective in destroying vermin and the blowfly pest. A committee was then formed with the idea of erecting a sheep dip at the sale yards.

MUNDOORA, March 25th.—The meeting discussed at length the questions of "Noxious Weeds" and "Compulsory Dipping of Sheep."

REDHILL, April 3rd.—The members discussed the question of "Noxious Weeds," and dealt particularly with the wild turnip and Salvation Jane.

WHYTE-YARCOWIE, April 8th.—Messrs. E. J. Pearce and G. F. Jenkins, delegates to the Conference of Mid-Northern Branches of the Agricultural Bureau, held at Wirrabara, delivered a report of the proceedings. Both members spoke in very high terms of the success of the gathering.

### LOWER-NORTH DISTRICT. (ADELAIDE TO FARRELL'S FLAT.)

GAWLER RIVER (Average annual rainfall, 17in. to 18in.).

March 25th.—Present: 11 members and three visitors.

HOW TO MAKE FARM LIFE ATTRACTIVE.—A short address on this subject was delivered by Mr. W. Richter. He said that it was important that the farmer who wished to have his home life on the farm made attractive should have the help of a good wife. In order that the farm might be made to produce to its fullest extent, other interests besides the growing of wheat should be undertaken. Cows, pigs, and poultry could easily and profitably be kept. Ornamental and fruit trees should be planted, good outbuildings erected, and the farm kept neat and clean. Mr. Dawkins also spoke on the social side of life on the farm.

## LONE PINE.

March 26th.—Present: 16 members and three visitors.

**SHEEP-SHEARING.**—Mr. W. Both, in a short paper on this subject, said two good pairs of shears should be provided and an oil or turkey stone. It was advisable to grind new shears before using them. Drivers should be fitted to the handles of the shears, and the stone kept moist with purified oil. Ten square feet should be allowed for each shearer, and the wool table erected near by in order that the shed hands could sweep the locks under the table. The catching pens should be close handy, and it was a good plan to have a grating laid down on the floors. The success achieved in shearing the sheep depended to a large extent on the positions the shearer adopted. For the first position the sheep should be sat up and a start made on the chest, the belly and inside of the hind legs could then be cleaned. That should be done by placing the hand firmly into the flanks. Next, the left side ribs, and right down over the tail should be shorn. Position 3, the sheep should be placed in an upright position, with the right leg of the operator between the hind and front legs, and the left leg placed firmly against the sheep's back. Then grasp the sheep by the nose, and pull the head over the left leg. Commence to shear in between the front legs and cut right up the neck to the right ear, and then clean the neck and right down the side. For the fourth position the sheep should be laid on its left side and shorn from the tail right up the back. Position five, the head should be placed between the legs, and the right leg and side cleaned off. That should complete the fleece. When trimming the legs from the knees downwards, the blade should always be kept in a straight line with the legs. Care should be taken to keep the top blade close to the skin, and to avoid second cuts. If possible all daggy sheep should be attended to before shearing was commenced. In reply to a question the speaker stated that he had found Stockholm tar a good remedy for cuts.

MALLALA (Average annual rainfall, 16.88in.).

March 4th.—Present: 10 members and one visitor.

**HARVEST REPORTS.**—The meeting was devoted to a resume of the recent harvest. Mr. A. E. Temby reported Late Gluyas averaged 15bush., King's Red, although sown at the rate of a bushel to the acre, came up thin, and only averaged 10bush.; 20 acres of King's Red was badly affected with rust. Oats cut just on one ton to the acre. Mr. Weatherill sowed only one paddock for grain with Gluyas wheat and averaged 16bush. to the acre. Mr. S. Angus—First paddock, stubble ground, cut one ton oats to the acre; second paddock, stubble ground, sown with King's Red, and badly affected with rust, yielded 12bush. per acre; third paddock (fallow) sown with Gluyas, stood up well and yielded 18bush. to the acre. Mr. K. C. Catt had nine acres sown with Cape barley (College seed) yielded seven bags to the acre. College Gluyas yielded eight bags to the acre, whilst Gluyas of own growing yielded 15bush., Baroota Wonder five bags per acre. All seed was pickled with bluestone, 1lb. to 10galls. water. None of the crops were affected with smut. Mr. E. Penfold had 20 acres fallow sown with Gluyas, which came up thin, and yielded 15bush. to the acre; 20 acres of Huguenot wheat cut two tons hay to the acre; 45 acres stubble, sown with Gluyas, averaged 15bush. Mr. J. T. Curnow sowed all Gluyas varieties on fallow ground. Late Gluyas yielded 23bush. to the acre, and ordinary Gluyas 15bush. to the acre. The hay crop cut one and a half tons to the acre. Very little rust was noticed. Mr. H. Temby's crop was rather disappointing. First paddock, sown in very wet weather with Marshall's and Leather Head, averaged 10bush.; King's Red, cut for hay, yielded one ton per acre; English barley on stubble ground averaged nine bags to the acre. Mr. F. A. Konzag had sown 25 acres maling barley, which averaged 10 bags to the acre. Huguenot wheat yielded one and a half tons hay to the acre; Baroota wheat averaged seven bags per acre; the Yandilla, affected by the rust and frost, averaged four bags; Dart's Improved averaged eight bags; Majestic, seven bags; King's Red, 20bush.; and Gluyas, 12bush. per acre. Oats cut three tons hay per acre, and six acres that were reaped yielded 86 bags. Mr. A. Nairn's first paddock, sown wet with Yandilla King, was shrivelled, but averaged 15bush.; Huguenot attained a height of 7ft., and cut four tons to the acre; Baroota cut for hay yielded three tons per acre, and that which was reaped averaged 28bush. per acre; English barley, sown on a sandhill, very heavy straw, grain pinched, averaged 25bush.; stubble paddock sown with Gluyas averaged 18bush. per acre; stubble paddock, sown with oats, cut 25cwt. of hay per

acre; stony paddock, sown with Gluyas, averaged 18bush.; Yandilla King, very much pinched and rusty, yielded 11bush.; Red Russian was the only variety that was smutty. At a meeting held on April 8th, Mr. J. I. Curnow contributed a short paper under the title of "Breeding Draught Horses." He said the motor car had considerably lessened the demand for light horses, but it would not be so with the draught horse for some time to come. A mare of suitable requirements should be selected—one of square build, well proportioned, and good tempered, and staunch. He advised mating maiden draught mares to a blood sire, because that would make it considerably easier for the mare at foaling. She should not be over fat for breeding purposes, and it would be an advantage to keep her in light work up to seven days of foaling. On no account should the mare, heavy in foal, be worked between the shafts. For the selection of a sire one should choose a farmed horse, and a worker. He should, of course, be a pedigreed horse, even tempered, with broad back and chest. The foal should be weaned when six months old. To do that the use of a loose box or pen quite apart from the mother should be chosen, and the foal fed on good body-building feed. Too often foals were turned out into the paddocks to shift for themselves and their constitutions were ruined. He estimated the cost of rearing a draught horse at £18, so that £20 would be the lowest price at which a draught horse could be sold profitably.

#### ROSEDALE.

February 27th.—Present: 21 members and two visitors.

ANNUAL MEETING.—The Hon. Secretary (Mr. F. H. Wolf) delivered a report of the proceedings of the Branch for the past 12 months. During the year 10 ordinary meetings were held, and several lectures were delivered by the departmental experts. The roll at the conclusion of the year showed a membership of 31 members. The election of officers then took place.

#### SADDLEWORTH (Average annual rainfall, 19.69in.).

March 23rd.—Present: eight members.

THATCHING HAYSTACKS.—Although opinions were divided as to the best method of covering haystacks, said Mr. W. G. Crawford, in a paper dealing with the thatching of haystacks, he felt sure that everybody would agree that they should be covered as soon as the hay harvest was completed. He considered a good thatch, properly put on, to be the best and most economical method of roofing the stack. To make a good job, a supply of young wattle sticks, each about 3ft. long, should be secured; they were much preferable to palings, as they did not pull out so easily. For several years he had thatched his stacks with wet straw, by drawing a tank of water alongside the stack, and dipping the sheaves in a trough. When forked on to the stack the strings were cut, and the straw spread out to the required thickness, putting the first row butts downwards, and every other row heads outwards. But during the last two seasons he had discovered a much better plan. The dry sheaves were forked straight on to the stack and used in the ordinary way, but the strings were not cut. If that idea were followed out the thatcher and his assistant would be able to do considerably more work during the day, and when the stack was required for use it was a very simple matter to strip off the sheaves. More straw would be needed, but the time and labor saved would more than repay. He quoted an instance on an adjoining farm where a stack had been thatched with dry straw two years ago. He stated that on opening a stack a short time ago there was not the slightest sign of any water having entered it.

SALISBURY, April 9th.—The evening was devoted to the discussion of various questions of local interest.

WATERVALE, March 25th.—Members discussed the question of "Noxious Weeds," and were of the opinion that where the weeds had taken a firm hold of the land it was impossible to destroy them. It was also thought advisable to hoe up any doubtful weeds that might be noticed.

## YORKE PENINSULA DISTRICT.

(TO BUTE.)

BRENTWOOD.

March 23th.—Present: 17 members and two visitors.

**RABBIT DESTRUCTION.**—Mr. J. E. Martin, in a short paper dealing with the destruction of rabbits said that during this time of the year when there was a scarcity of green feed, pollard and phosphorous baits could be laid with good effect. He further pointed out that if farmers wished to kill the rabbits in large numbers it was essential that they should all commence operations at the same time. He gave preference to the use of the poison cart, because it did not make so wide a furrow as the plough, and on that account there was less likelihood of the stock picking up the baits. There would be still less danger if a chain was dragged behind the cart. He had also employed wire netting traps with a fair amount of success. Another plan that had proved successful was to place a bait on a piece of board and push it into the burrow as far as possible, and then block the hole up. In the discussion that followed Mr. Honner believed that where rabbits were very numerous the poison cart as advocated was best, but there was no doubt that it was dangerous to sheep. Many of the native birds, especially magpies, were also destroyed. Where there were burrows he did not think the poison cart necessary. His practice was to mix the phosphorous pollard with molasses or sugar, smear some on one side of a large stone, and block the burrow securely with the stone. In nearly every case the rabbits inside had been exterminated. Mr. Nation agreed with the paper in respect to the poison cart, but had found that a disc attached was better than a chain. He also favored simultaneous poisoning by all the farmers in the district. Mr. Newbold agreed with the paper generally. The plan he adopted in dealing with rabbits took time, but was well worth the trouble. His practice was to put the poison well down the burrows and then dig them in, taking care to go round daily for some time to attend to any which had been dug out again. The next thing was to clear out all stone heaps, &c., and a tip-top job would have been accomplished.

**MOONTA, March 30th.**—An interesting discussion on the question of "Grading and Selection of Seed Wheat" was introduced by Mr. A. B. Ferguson.

## WESTERN DISTRICT.

**GREEN PATCH** (Average annual rainfall, 26.56in.).

March 28th.—Present: 10 members and two visitors.

**DAIRYING.**—The Hon. Secretary (Mr. R. L. C. Sinclair) who attended the recent Conference, held at Yeelanna, said that the districts in the vicinity of Port Lincoln were very suitable for the pursuit of dairying. He reported on the advice tendered by the Government Dairy Expert (Mr. P. H. Suter). Mr. Sage said he had found the Port Lincoln district well adapted for dairying, and he had always been able to grow summer fodder crops. When sowing maize and sorghum he had received best results from the deep sowing of the seed. Mr. Parker gave preference to Ayrshire cattle for dairying stock.

KOONIBBA.

March 21st.—Present: seven members and one visitor.

**WHEAT OR LIVESTOCK.**—Mr. E. A. Hasting, in a short paper on this subject, said that for some time ahead the energies of the farmers of that district must naturally be devoted to the production of wheat, but as the growth of natural grasses superseded that of the scrub, and supplies of water were more abundant, the stock-carrying capacity of the farms in the mallee districts would be greatly increased. Much of the land on the West Coast would not stand too much working, because, being of a light nature, it was inclined to drift, and a few sheep could always be kept to keep the weeds down. The speaker, in concluding the paper, urged members not to consider which was the most payable, wheat or livestock, but to combine the two together, and endeavor to produce in larger quantities wheat and livestock.

In the discussion that followed, Mr. Thistleton said that sheep greatly increased the value of the land. Rev. Appelt considered that the high price of fencing materials prevented farmers going in for sheep.

#### MINNIPA.

March 30th.—Present: eight members and three visitors.

**SMUT ON WHEAT.**—The Manager of the Experimental Farm at Minnipa (Mr. L. J. Cook) contributed a paper on the above subject.

**BOOKKEEPING FOR THE FARMER.**—Mr. A. J. Godlee, in a paper dealing with this question, said good management meant success for the farmer, but without a set of books management would be unsatisfactory. He felt sure that if all farmers were to adopt a system of bookkeeping there would be a very marked reduction in the number of assigned and insolvent estates among the farming community. By adopting a suitable system of bookkeeping the farmer would know, not only how his farming was paying him, but, on the other hand, he would soon see what branch of the farm was giving the best returns, and also those branches on which he was losing money. He would be able to ascertain what the cost of clearing the land amounted to, and the improvements that from time to time were undertaken. He would also know by figures what the farm was worth, to say nothing of the innumerable small items that would be brought under his notice in their true value, that without bookkeeping were unnoticeable, but often meant the difference between success and failure. He would not suggest any complicated or difficult form of bookkeeping for the farmer, in fact the easier the better. The following set of books should meet all requirements:—Ledger, day book, and cash books. If the farmer had not kept any previous records, and was desirous of opening a set of books, he could adopt the following course:—General stock-taking at a certain date, say, when the wheat had been sold. From the stock sheets he would open a set of books, and enter under its correct name in the ledger and cash book each item, and find out the financial state of his affairs. When dealing with the household account a rough note of all accounts owing for goods should be kept, and when paid that amount should be credited to the capital account as money drawn for own uses. Having now completed entering under their various headings the amounts owing to sundry creditors, representing the liabilities, the same procedure should be gone through when dealing with the assets. For that purpose the latter half of the ledger could be used. The cost of all improvements, including own labor would be entered on the debit side of the general improvements account, and all depreciation entered on the credit side. The difference of the debit side over the credit at end of each year would be the value of improvements. Enter on the debit side of the plant account the cost of all new plant as purchased, and all losses and depreciation for the year on the credit side. Repairs must not be entered to the above account, because they were part of the cost of the upkeep of the farm, and should be entered in the account of expenditure. The stock, or goods account must be carefully kept to give accurate account of the dealing. To that account all increase in stock, wheat, hay, &c., harvested should be carefully entered to the debit side, and all produce, stock, and also wheat marketed or otherwise sold should be placed to the credit side. Having completed the entering of all items from the inventory sheets to the ledger, showing the liabilities and assets, a balance sheet should be drawn up. That could be given a folio in the ledger. After ascertaining from the balance-sheet the amount of asset over liabilities, which represented the net capital, further accounts should be opened to record future dealings. Having found the net amount of the capital a further account should be opened in the ledger under the name of "Capital Account," and transfer that amount to the credit side of the capital account. The capital account could be kept under the name of the farmer in the following manner:—On the debit side all sums drawn for private use, such as the household account and such money paid away to the debit side of the capital account. Any amounts received from outside sources and the profits of the farm, would be brought from the profit and loss account, and entered to the credit side of that account. On the other hand, if the profit and loss account showed a loss instead of a profit on the year's transactions, such loss would be entered on the debit side of the capital

account. The profit and loss account enabled one to ascertain the profit made for the year, if any, or the extent of the loss, and should be conducted as follows.—Having already entered the amount of the capital as shown in the balance-sheet at January 1st, 1918 to the debit side at the close of your year's business, 5 per cent. interest on the capital should be debited to that account. On the credit side should be entered the net capital at December 31st, 1918, as shown in the balance-sheet on that date, and all cash taken for private use during the year (as ascertained from the capital account in the ledger). Then add up the two sides and balance. If the credit side showed more than the debit side the difference was net profit for the year, and was carried to credit side of the capital account as profits. If a loss was shown it was carried to the debit side of the capital account. Having ascertained the net profit one would then show the gross profits. The cost of improvements were not entered on the trade expenses account, but should be entered on the debit side of the improvement account in the ledger. The ledger now being ready for the posting of transactions for the year a cash book or diary for recording each day's business should be opened. In the day book or diary was entered the various transactions for each day, and at the end of each day or week these items were posted or entered under their correct account in the ledger and cash book (or petty cash book, if that book was kept). He would not advise keeping a petty cash book, as the farmer's transactions in cash were not sufficient to warrant it, most of the transactions being made by cheques. The cash book had a page each for debits and credits, thus allowing ample room for clearly recording each transaction in detail. In opening the cash book the first entry was cash on hand and credit balance at bank. By turning to the bank account in the ledger the balance at bank found there should be entered to the debit side of the cash book. All money received should also be shown on the debit side of the cash book. Thus all money paid out either by cheque or cash should be entered on the credit side. At the end of the year, or when the account was balanced, all cash on hand and credit at bank should be entered on the credit side of the book. Thus, if the accounts had been correctly kept the cash book should balance, and that amount carried forward to the debit side of the book ready for next year.

#### O'LOUGHLIN.

March 27th.—Present: seven members.

PREPARATION FOR SEEDING.—The monthly meeting of the Branch was held at "Ross Vale" Homestead, when Mr. E. E. Lutz contributed a paper dealing with the preparation of the soil for seeding. It was important, he said, that one should study the soil of the district, because different classes of soil required different treatment. Land of a sandy nature should be ploughed to a depth of about 4in., and the seed sown evenly. New land could be sown at least five years in succession, provided a good burn was secured each year. He emphasized the care one should exercise to see that only clean, good seed was sown on these first crops. The working of old land would, of course, be different. With seasonable weather conditions the fallowing should be done during July to a depth of 4in. The land could then be left for four weeks, and then cross-harrowed. If time would allow that could be done twice. If left then for six weeks it would give any weeds and rubbish a chance to make a start. The land should then be worked with the skim plough, preferably when the weather was a little dry. A few sheep running on the fallow at that stage would kill a great number of weeds and consolidate the land. All stumps, etc., should be cleared off the land before seeding, so that a good bed for the seed was secured. The Hon. Secretary (Mr. E. O. Dahl), in opening the discussion, remarked that when fallowing close attention should be paid to the plough to see that each furrow was cutting the full width of land. Members did not agree with the writer that the fallow should be ploughed just before seeding. Members considered that by so doing those properties necessary for the successful growing of the wheat plant were destroyed. In breaking up new land Mr. Bergman said that 4in. was too deep. If that land was worked any deeper than that he thought the soil would be very bitter. As many roots as possible should be pulled out, because they took a large quantity of moisture out of the land.

YADNARIE (Average annual rainfall, 14.09in.).

March 23rd.—Present: eight members and one visitor.

**SHEEP ON THE FARM.**—Mr. A. Sprigg, in a short paper on this subject, said the farmers of Eyre's Peninsula should seriously consider the question of raising lambs for export. In order that one should obtain sheep of good quality, and at the same time stock that would mature quickly, he recommended the mating of a Merino ewe with a Dorset Horn ram. For the second time of mating a Merino ram should be used, because if that plan were adopted the wool produced would be of a finer texture, and the sheep would not be troubled with the wool growing over their eyes. Neither did he think the breed previously mentioned to be such bad sheep for fences, as some of the other Crossbreds. He advised the mating of the ewes during January or February, thus ensuring an early lambing while there was plenty of good green feed. Besides being one of the best sidelines the sheep were a great help in keeping down the weeds on the fallow, and they also assisted in destroying mallee shoots. Not only were the Crossbreds larger in frame, but they also tended to lay on flesh quicker, and to retain their condition for a longer period than the pure-bred animal. Mr. F. W. Jericho, in discussing the paper, said the very high prices now ruling for sheep made it almost impossible for the farmer in the mallee to secure a flock. Mr. G. B. Kobelt was of the opinion that the almost prohibitive price of fencing materials prevented many farmers from keeping sheep. Mr. J. H. Kruger also favored the Dorset Horn-Merino cross as the sheep best suited for that district. He thought November and December mating preferable to that of January and February. Mr. A. A. Dreckow agreed with the writer on the advantages to be obtained from having a small flock of sheep on the farm. He considered that a farm of 1,000 acres should carry at least 200 sheep. Some members might think that a very low figure, but when one came to consider that the only feed the mallee districts could supply their sheep with was natural grass and stubble, that estimate was a very reasonable one. Messrs. W. L. Brown and G. A. Dreckow also spoke.

**TALIA**, April 3rd.—A paper from the *Journal* on "Harvester versus Stripper" was read by Mr. J. G. Dolphin, and a good discussion followed, the meeting being unanimously in favor of the harvester. A short discussion on the "Pig Industry" concluded the meeting.

**YANINEE**, March 28th.—The Dairy Expert (Mr. P. H. Suter) and the Acting Secretary of the Advisory Board (Mr. H. J. Finnis) attended the meeting and delivered addresses.

## EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

### BRINKLEY.

March 30th.—Present: 10 members.

**HARVEST REPORTS.**—The meeting took the form of a general discussion on the results of last year's harvest. Mr. E. T. Humphrey had grown Gluyas smut-proof and Budd's, the last-named yielding five bags per acre, with 60lbs. to 70lbs. super. Mr. White's best yielder was Lott's, 8bush. per acre with 60lbs. super. Mr. Martin reported Budd's and Marshall's yielded 8bush. with 60lbs. super. Messrs. Pearson Bros. had sown Marshall's, Budd's, Bayah, Federation, and IXL; the last named was badly affected with rust, and had to be cut for hay. Bayah yielded the best sample, average 8bush. with 60lbs. super. per acre used.

### COONALPYN.

October 26th, 1917.

**WHEN IS A SCRUB FARM READY FOR SHEEP?**—The following paper was contributed by the Manager of the Kybybolite Experimental Farm (Mr. L. S. Davie). "If the necessary fencing was made one of the first undertakings on a scrub farm, with the object of starting the flock at the same time as the cultivation of the land, that would be the most profitable practice that could be carried out in this district,

as well as most others of like nature that I know of. I can quote from the experience of settlers in the part of the West Coast where I was stationed. When visiting there this year I was struck by the fact that farmers working with stock had made a success of their holdings, whereas, almost without exception those following cereal-growing alone had failed. There were dozens of holdings thrown up by these men that had not been reallocated, and were fast returning to the scrub condition. Those experiences are those of farmers in a district where it was supposed that sheep could not be kept until the land was cleared to a certain extent, but in speaking to the various farmers I find that their viewpoint is entirely changed, and that they now kept sheep in the natural scrub. I mention this to emphasize the fact that I have no doubt that a few sheep can be kept in the earliest periods of a scrub farm, and that their earning capacity is sufficient to make an important factor in the successful working of that farm. One of the particular advantages from stocking a farm from the earliest possible moment, is the fact that a farmer always starts with a certain amount of capital or credit, which in a few years becomes absorbed in developing the place, and there is then little available for stock purchases, whereas if these purchases are made a first charge against capital, they are capable of returning the outlay, to be then used for any other purpose, and will continue to bring in returns, which will considerably help to keep the balance on the right side of the ledger. Where sheep can be kept, and are not, there is a wasted earning capacity running into hundreds of pounds, with the high prices now ruling, on most farms. It is, perhaps, hard to realise this except by actual experience. I venture to say that 100 sheep could be kept on any one of your farms in the early stages practically without your realising that they were on the place as far as provision of food is concerned, and yet the returns from that number of ewes at the present prices would be at the very least £100 per annum, even with prices at half the present rates the returns would be very profitable. The outlook of the scrub farm from an immediate sheep-carrying point of view has therefore this most important point of greatly increased direct revenue. Sheep on a scrub farm are also a useful item in the clearing operations by nipping off the young scrub growth, tending to weaken its vitality, and enabling it to be more easily killed. Sheep on the farm soon increase the value of your property from a crop-raising point of view, putting to a profitable use crops that might grow well, but have no other means of being put into a marketable form. This is the chief advantage of the mixed farm, and enables maximum profits to be obtained. For example, possibly oats can be grown well, but the area of this cereal is generally restricted, because of the limited demand for the grain. This will stand heavy feeding in some districts provided there is no weed growth, and still give maximum returns—that is a matter for testing in your district. The point is, however, that the crop is under those conditions perhaps made doubly valuable through the sheep. Even if not able to feed down profitably and still get grain, it is possible that oats would be found a profitable crop grown for sheep feed alone. At Kybybolite we sow down various areas every year as a matter of fixed practice to rye and oats mixed (seldom under 50 acres) for the purpose of providing winter and spring feed for stock. If feed is plentiful the crops might be left after feeding down to the end of August, and very fair cuts of hay have been obtained in this way, but the object of these areas which are sown early is simply to provide stock feed, and any hay or grain that might be obtained when the feed is not needed is simply looked upon as a wind-fall. The most successful crop for summer feed in our experience at Kybybolite is thousand-headed kale. It practically ensures an adequate supply for that period, and I see no reason why that crop cannot be grown to great advantage in your district. Without sheep, however, the most luxuriant growth of this or any other fodder of the same type would be absolutely valueless to you. This crop carries over two summers, and will, under ordinary conditions, average over five or six sheep to the acre for the six warmest months of the year. To ensure regular feed a certain area should be sown every year, and you thus have a first season's and a second season's growth in the one year. Sheep on the farm, besides making a means of marketing crops are profitable in common with other stock, because they put back into the soil a valuable portion of that which is taken out by the crops grown for fodders, and the more one can return to the soil in this way the nearer they come to the most profitable form of agriculture—a rotation, in which stock fodders are the main items. Sheep also help the farm practice in many ways, making the working of



the land more economical and profitable. This includes the feeding off of weeds to assist in killing same by cultivation, eating off rank growth before ploughing, when if long, greatly increased cultivation would be necessary to prepare the ground for the purpose desired. The treading of the sheep in cleaning up fallows and other ploughed land is also of great assistance in preparing a good seedbed. In these remarks I have emphasized the benefits that result from sheep at any time, and you may think that they do not directly bear on the question as to the time to get them on to the scrub farm, but I fail to see how the position differs on the scrub farm or any other. They are necessary to the profitable working of any of our farms at present, where it is possible to supply the fencing and water, and on the scrub farm where these are available, I contend that provision should be made at once for keeping sheep in small numbers, which can be increased as the carrying capacity improves." Mr. Davie, after inspecting part of the district, considered that the place should develop along mixed farming lines. The heavy soil and abundant rainfall would lend themselves to the growing of various fodder crops for sheep, pigs, and cattle. He very strongly advocated working with sheep as soon as one could possibly manage it. At a later meeting, held on November 23rd, 1917, a paper on "Cultivation" was read by Mr. T. Crotty. He favored the use of the share plough for that type of country, because it considerably assisted in clearing the land of stones and stumps. He suggested that 250 acres should be ploughed twice, because the weeds grew very fast. It was advisable to work the harrows after each ploughing, and see that all stones and stumps were cleared off the land before seeding was commenced. He considered that it was a much better plan to thoroughly cultivate 250 acres than to try and put in a larger area in a slipshod manner. Mr. J. Angel also contributed a short paper under the title "Best Implement for Working Fallow." He gave first place to the skim plough because it turned the weeds under, thus improving the soil. A spring-tooth cultivator could be used to give the land a good stirring up, and the use of that implement enabled one to work a fair area during the day. "Breaking and General Care of Colts," was the title of a paper read by Mr. R. Venning, at the meeting held on January 25th, 1918. He said he would commence to handle the colt when it was about two or three weeks old, by catching it occasionally when the mare came into the stable. At five to six months old the foal could be weaned, and it was most essential that at that stage of the foal's life it should have the best care and feed, if one wished it to develop into a useful horse. To teach the foal to lead, it was a good plan to lead it to water; that would also accustom it to having a rope around its neck. After being looked after in that manner for about six weeks he could be turned out with the other stock, provided the weather was not too severe; in that case it would be just as well to stable him during the night. He thought 2½ years was a good age at which to break the horse in. The first lesson would be to have a bridle put on, the animal being mouthed for a little while each day. Reins should then be tied from each side of the mouth to a girth, and the reins shortened gradually until the head was brought in short. A collar and hames could then be put on, and the colt driven around with a long pair of reins. That lesson would teach him when to start and stop, and also accustom him to the whip. Next he should be harnessed to a log with a long pair of traces, and after a few lessons of that description he should be ready to assist in the general work of the farm. Mr. W. McCracken also addressed the meeting on the subject of "Water Conservation." The Wool Instructor (Mr. Henshaw Jackson) attended the meeting held on February 26th, and addressed the meeting on "The Advantages of Sheep on Scrub Blocks." At a meeting of the Branch, held on March 29th, a paper was contributed by Mr. F. Pitman under the title of "Best Method of Treating Local Mallee Farms." For following the speaker advised the use of a four-furrow share plough. Plenty of draught should be put on the machine, and the land ploughed as deeply as the nature of the soil would permit in order that as many stumps as possible might be brought to the surface. If a railway station was in the vicinity of the farm, the stumps could be carted and sold, but if not they should be heaped on top of those stumps that had not been pulled out and burnt. The land should then be harrowed. If the land was sufficiently moist, and one had the time, it would be an advantage to again plough the land in the opposite direction. He strongly advised the working of the land at all times when one was able to do so, because by the constant working of the land the growth of the shoots would be checked to a large extent.

He also thought the sheep would materially assist the farmer in that direction. As many oats as could conveniently be sown should be drilled, because the stubble from that crop generally enabled one to secure a good running fire that would destroy the mallee shoots. He was not in favor of the practice adopted by many farmers in the mallee, namely, that of burning off, and after taking two or three crops of the land, leaving it out for pasture. Areas so treated would easily get beyond control. Once an area was rolled down it should be thoroughly conquered before attempting to treat any more land. Another paper on the same subject was contributed by Mr. G. Cavanagh. He said the scrub should be rolled in March, and left until that time next year, when a suitable day for burning should be chosen, care being taken to prepare a good firebreak beforehand. The plough should then be started. If it was intended to sow that season the land should again be ploughed in the opposite direction. The better plan would be to leave the land as fallow until the next year. If that was decided upon the land should be worked in July and again in October, then again before seeding, and finally harrowed after being sown with wheat. When stripping was finished one should endeavor to secure a good stubble burn by raking the straw. The land should again be fallowed in July, and then worked for sowing with oats the next year. The stubble should then be fire-raked, and the land lightly run over with a plough and left as a self-sown crop. Under the heading of "The Care of Farm Implements," a short paper was read by Mr. H. E. Watson. He said all agricultural implements should receive careful attention, especially those parts that required lubricating. Upon finishing work in the paddock they should be securely housed from the weather and thoroughly overhauled. He considered it was a good plan to give the machine a coat of paint to preserve the woodwork. Another good plan was to place a stand under the comb, thus taking the weight of the rack.

#### LAMEROO (Average annual rainfall, 16.55in.).

December 1st.—Present: 17 members.

FODDER-GROWING FOR STOCK-RAISING.—A member contributed a paper on this question. He thought that farmers in the district of Lameroo should devote more attention to the growing of fodder and the raising of stock. Oats and barley could be sown early, as they would provide good feed for stock in winter. Pease, rape, millet, &c., could be sown later to provide summer fodder. If a farmer were to cultivate 150 to 200 acres and sow them with oats, a fair flock of sheep, and a number of cattle could be kept, for which he could readily find a market. From what he had seen of the stock of that district he was convinced that with the proper rations the mutton and beef that could be produced would be equal to that of any other. He laid particular emphasis on the pea crop. Not only would the stock do well on it, but the land was considerably improved by the nitrogen that it gave to the soil. For the successful management of the sheep one should allow the flock a frequent change of pasture. Not only would that give the feed a chance to keep green, but it would also keep it fresh and sweet. Mr. E. J. Trowbridge said growing rape and millet for summer feed was not a success. He advocated putting stubble land in early with oats for feed. Mr. A. J. A. Koch said that in the absence of early rains the feed was scarce during the winter months. Last year he had sown pease where he expected to get takeall. This year oats had been sown on the same ground, and he had twice the hay he had secured where wheat had been grown. Mr. A. Townsend thought farmers would do well to cut their holdings into smaller paddocks; less labor and money would be required, and stock-raising could be carried on on sound lines. Mr. F. W. Eime thought running sheep on the crop during the wet months helped to destroy takeall, because they packed the ground.

#### MERIBAH.

March 27th.—Present: 11 members.

A paper was read from the *Journal* dealing with the "Best Method of Treating Small Mallee and Porcupine." Mr. J. S. Crouch, in opening the discussion, thought that as far as shoot-cutting went in that district it was not a very successful method of destroying the mallee shoots. A good strong fire was the best plan that could be adopted. Mr. Miller agreed with the writer of the paper that the use of the share plough was preferable to that of the disc for the destruction of the porcupines.

## MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

Present: seven members and one visitor.

GRADING SEED WHEAT.—In a short paper on this question Mr. E. Hartmann said all seed wheat should be graded before it was sown. All small and cracked grain and foreign seeds would thereby be removed, and the drill would distribute the seed evenly. As an experiment, last year he had sown two strips of land, one with graded and the other with ungraded seed. The graded wheat, when cut for hay, had yielded quite half a ton more per acre. In discussing the paper all members were agreed that seed wheat should be properly cleaned. Some members thought that if the wheat was put through the winnower a second time the sample would be good enough to use for seed.

## MORGAN (Average annual rainfall, 9.29in.).

March 30th.—Present: seven members.

EUCALYPTUS OIL.—Mr. Hoffmann initiated a discussion on the manufacture of eucalyptus oil. He said it was a pity to destroy the mallee shoots when there was a chance of making something out of them. There were several species of mallee in the district. Mr. Heppner thought that it would pay to establish a factory, as the farmers could be paid for the leaves instead of going to the expense of providing and working a still. Mr. Pope said it would be a good plan for several farmers to club together to provide the necessary plant, and the result of their distilling could be sent to market in bulk. Mr. R. Wohling was confident that if a start was made in the district there would soon be a number following in the industry. The Hon. Secretary (Mr. W. F. Plummer) thought it would not cost very much to give the industry a trial.

## MYPOLONGA.

March 27th.—Present: 11 members.

SPRAYING AND SPRAY MIXTURES.—The Fruit Inspector for the River Murray Areas (Mr. H. J. Darwent) delivered an address on the above subject, and in the course of his remarks, said:—"Spraying is a necessary part of the routine of orchard work, but by many it is not recognised as such. It is expensive, and knowledge and care are essential in order to prevent useless expense. It is not many years ago that one could plant a tree, and without spraying expect a clean crop of fruit, but that time has now passed, and unless we take precautions to combat both insect pests and fungus diseases all our other work is to a great extent nullified. With the interchange of fruits and plants from other parts of the world, pests and diseases hitherto unknown in this State have been introduced, while many which are indigenous to Australia have found the orchards and vineyards a congenial home when trees and vines have been planted in their haunts. This has increased the labor and expense of orchardists and vigneron, but is perhaps not an unmixed evil, as without any pests or diseases fruit would be so easily grown that there would be no need for the orchardist. To spray a tree or plant without knowing what is affecting it, is akin to a physician prescribing for a patient whom he has not examined, and would almost invariably end disastrously, as we may use an altogether unsuitable remedy, and spray at the wrong time. It will then be readily seen that we must first determine what is the pest or disease affecting the tree or vine, then choose the proper time to attack it, and use a suitable remedy with proper appliances. There will then be little difficulty in checking or eradicating the trouble. From the foregoing, then, we find that spraying is inseparable from a knowledge of the life history of insects and fungi. Spraying must be done to coincide with the nature of the pest to be dealt with as regards the time and the substance to be used. There is no great cure-all which will answer for every pest or disease, any more than one medicine which will cure all the ills to which flesh is heir. It is well to remember this fact, as some vendors of spray mixtures are as persistent in claiming such virtues for their articles as are some who advertise patent medicines which cure anything. Truly there are spray washes which serve a double purpose, and it is wise to use such when possible, but there are few of them. Use only proved remedies, except when experimenting, but do not use the whole orchard for the purpose of experiment. Large growers can perhaps more

economically prepare their own mixtures, but the greatest satisfaction will be found in using ready-made proved remedies. Keep closely to well-tested formulae, only departing from them when experiments have proved that stronger or weaker strengths are not injurious, and are effective. Spray thoroughly, so that every part of the tree is wetted, as whatever the pest or disease, it is no use leaving half the tree without a coating of spray if we wish to eradicate the trouble. If heavy rain should fall, repeat the spraying as soon after as possible. A little moisture after the mixture has dried on the tree is rather a benefit than otherwise, as it tends to spread the mixture evenly over the tree, coating any portions which may have been missed. Spraying for fungus diseases is not so much a curative as a preventive measure, or, in other words, it is too late to apply remedies after we can see the damage done by the disease. A fungus is a plant, and is parasitical, living on the trees and fruits. It produces seeds or spores and roots known as mycelium, but differs from other plants in that it has no flowers or the green coloring matter. The roots penetrate the tissues, and find their way down into the cells, breaking them down, and causing the damage as we see it. We may then, perhaps, prevent the further spread of the disease, but without removing the affected parts we are unable to eradicate it. But when we see the damage done the disease is generally so widespread on the trees as to have a serious effect on it for that season. The mycelium, or roots, send out branches, each of which is furnished at its end with a spore containing many seeds. The mildew, or mould, we see on plants is this mass of spore-laden branches. The seeds detach themselves from the branches and float over the tree in moisture. This is the reason why damp springs are so favorable to fungus diseases. From the above it will be seen why spraying is part of the routine work of the fruitgrower. The suitable remedy must be sprayed on to the tree to be in readiness to kill the spores as they come in contact with it, preventing their spreading over the trees, and taking root. The spray wash dries, but the moisture necessary for the spread of the spores or seeds also makes the solution which destroys them when they float into it. Heavy rain would necessitate a repetition of the spraying, so that a remedy is in readiness during the danger period. The resting or winter spores, which are carried over from season to season, should be attacked with a strong fungicide as soon as the leaves fall in autumn. If left too long their covering becomes tough and leathery, and they are then most difficult to reach with the fungicide. This, while it is an important spraying for fungoid diseases, is not sufficient. The trees should be sprayed again as soon as the first sign of growth is noticed in spring, and in damp districts followed by another application as soon as the blossoms have fallen. All dead leaves, old fruit, and prunings should be raked up and burned, as on them the spores are often found. There are many fungicides, but the best known and most generally used are the different copper compounds. Sulphate of copper is the form in which these fungicides are used. It may be used alone when the trees are dormant, but it is necessary to add lime or soda to convert it into a basic sulphate for summer use when the trees are in foliage. This is insoluble, but the action of the carbonic acid of the air liberates the ordinary sulphate gradually, and so it kills the fungi. It is very important that only enough lime or soda is used to precipitate all the copper, but no less. This can only be determined by testing. If too much lime or soda is used there is no liberation of the sulphate, and consequently no killing of the fungus. On the other hand, if insufficient lime or soda is used, the foliage will be burned. The testing is done by placing a few drops of ferrocyanide of potassium in water in a white saucer, and dropping into it a few drops of the fungicide. If there is too much copper a brown coloration will be seen as each drop comes into contact with the ferrocyanide solution. A fairly accurate test can be made by dipping the bright blade of a pocket knife into the solution and examining it when dry for signs of copper. Lime and sulphur mixture has been extensively used in the last three years, but, unless there is a fairly warm temperature, it does not give as satisfactory results as the sprays composed of copper compounds. It, however, is a dual purpose spray, as in addition to being a fungicide, it is useful for eradicating the bryobia mite and scale insects. Care must be taken in using it on trees in foliage, or burning may result. Spraying for insect pests differs from that for fungi in the materials used, the time for spraying, and in that the operation is curative more than preventive. It is essential that we should know the life history of an insect, as many are only vulnerable at one time during their existence, while others are exposed all their lives.

It is thus necessary that growers should equip themselves with this knowledge so that they may attack the insects with the greatest prospect of success. For the purpose of this paper we may divide the insects into two classes—chewing and sucking. It is obvious that for the former it is necessary to place something on the food that it eats which will kill them, so we use a poison, the most successful being arsenate of lead. But while it is a poison, and many object to its use for that reason, the spray mixture is in such a dilute form that it is perfectly harmless to any but the most minute insects. The caterpillar of the codlin moth, when it first attacks the fruit is so small as to be almost invisible to the naked eye, and so the little poison necessary to kill it is quite harmless to human beings. But while this spray wash will kill the insect it must be borne in mind that the time of application is of great importance. If we neglect to place the poison on the fruit before the caterpillar has entered it, then the labor and expense is wasted, as once it is beneath the skin there is no chance of it getting any of the poison. Similarly, if the work is not done thoroughly much loss will be sustained. If some of the fruits are not coated with spray, then they are unprotected. As there are three broods of this insect in a season it is necessary to spray several times so that poison may be in readiness on the trees for each brood. These spray mixtures are of no use against the second class of insects—those which suck. They pierce the bark of trees and suck from them, so that poison placed on the outside will have no effect on the insects. For these pests we must use a spray which is caustic, or which corrodes the insects, stopping the breathing pores, and so suffocating them. These insects are exposed, and so are vulnerable all their lives. But while such is the case, they are divided into those which fasten themselves to the trees or plants, and those which fly from tree to tree. The former are much more easy to deal with than the latter. Those which fly from tree to tree are difficult to kill by spraying, for as soon as that operation is begun they fly to other plants. Benzole emulsion and tar water are effective for these insects, not so much by reason of their killing properties as that the insects have an aversion to the smell. Kerosine emulsion, resin wash, tobacco wash, red oil emulsion, and lime sulphur mixture are used for those which fasten themselves to the trees. Fungicides—Bordeaux, Woburn, Burgundy, and lime sulphur mixtures. Insecticides—Arsenate of lead, red oil emulsion, kerosine emulsion, resin wash, tobacco wash.

#### NUNKERI AND YURGO.

April 7th.—Present: 12 members.

STUMPS AS A SIDE LINE ON NEW MALLEE FARMS.—This question was brought forward by Mr. D. Bicknell in a paper under the above heading. Probably the greatest obstacle in the way of growing profitable crops in new mallee, he said, was the number of roots in the ground. All farmers in that class of land would agree that it was impossible to grow wheat and mallee at one and the same time. It was useless advising farmers to pull out the stumps unless one could show what to do with them when they were pulled out. To pick up stumps after a heavy ploughing in light country would cost at least 3s. per acre, an item that kept most farmers from ploughing deeply. It was but rarely that the stumps could be disposed of profitably, sometimes they had been as low as 13s. a ton at Mile End, a price that did not pay for horsefeed. Merchants were, of course, aware of the nature of the farmer's work, and the price of stumps was regulated accordingly. After harvest and after fallowing, the firewood market was low. Those were the very times that the farmer must cart his firewood. Often he loaded his trucks without knowing what return he would receive. By force of circumstances and lack of organization, he was compelled to play into the hands of the dealers and merchants. They were able to stock up at low prices, and when other work forced the farmer to stop carting, the prices would rise. The state of the trade compelled farmers who depended partly on the sale of wood to cart their wood when they should be doing their farm work, and to do their farm work when they should be carting wood. That was undoubtedly a factor that helped to reduce the grain yield in Murray lands. Firewood was looked upon as something which must be got rid of at the smallest possible loss. However, he did not see why the roots should not be a source of profit. The co-operative principle offered a solution of the problem. Why should they not handle their own firewood in the city? Worked on that basis, it would be possible to make that trade of vast assistance to the farmer, without increasing

the cost to the consumer. On co-operative lines, there should not be any difficulty about making advances to suppliers on unsold firewood, and delivery could be postponed until a suitable time. That point alone, without the possibility of a larger return, should help some who were not financially strong. They should then be able to do farm work when it should be done, and could afford to clear the land, and to plough as ploughing should be done. The capital required for the wholesale trade would not be very large, since no plant would be required. It was evident from the discussion which followed the paper that the subject was an interesting one. Members agreed that the present system was unsatisfactory. Mr. F. G. Williams considered that, if farmers in the Murray lands were to form an association or company to deal solely in firewood, it would be a great improvement. He thought there were too many profits between the producer and consumer. A fair price for roots, in his opinion, was 20s. per ton on trucks at Mile End. That would pay expenses. Mr. Sanders thought the co-operative idea would be a great help to producers. The present prices, on account of the bad road to the siding, did not pay him. It took too much money to pick up and burn the stumps; therefore he was under the necessity of leaving the roots in the ground, as far as possible, to the detriment of his crop. Mr. J. D. Aikins agreed with Mr. Sanders. He could not cart stumps at the present price, and could not afford to pick them up and burn them. His ground, therefore, was only half-worked. That had always been a difficulty in new mallee country, and until means were taken to put the business on a reasonable basis, it always would be a difficulty. Mr. Aikins pointed out that there was a difference of from 10s. to 12s. between the price of roots on trucks, Mile End, and the price to consumer. That had to cover unloading, loss in weight, cartage, and other contingencies. In his opinion the co-operative system presented the best method of dealing with the matter. The association would, of course, have to be in a position to buy the roots when farmers were able to deliver, stacking any surplus at a central site; also they would have to make advances to producers on uncarted roots.

#### WILKAWATT (Average annual rainfall, 16in. to 17in.)

February 23rd.—Present: six members and two visitors.

IMPROVING FARMING PRACTICES.—In a paper dealing with this question Mr. A. B. Neville said that to improve upon the present conditions existing on the mallee farms three things should be considered, viz., dividing the farms into smaller paddocks, to improve upon the present system of working the farm, and to increase its stock-carrying capacity. At the present time most of the farms were divided to work under a four-years' rotation. That was a good system so long as one had to deal with the mallee shoots and stumps, but now that the holdings were becoming more settled, some other working plan should be adopted. To do that the farm would have to be divided into smaller paddocks. Even though the high prices of fencing materials made that impossible, preparations could now be made against the time when prices were again normal. In most cases the four-years' system of cropping was as follows:—Wheat, oats, grazing, and then fallow. He thought that could be improved upon by the adoption of the following plan:—For the first year wheat could be sown on the fallow, and instead of burning off the stubble, oats could be broadcasted, and a light disc implement run over the land. By doing that feed would be supplied for the stock during the coming year. For the third year the land could again be fallowed, and the fourth year a crop of oats drilled in. The following year fodder crops for sheep could be sown. If fallowed the next year it should be nice and clean, and ready to receive a crop of wheat. To improve upon the present stock-carrying capacity of the farm it was necessary that the land should be divided into smaller paddocks, so that the sheep could feed them off quickly and have a change of pasture; not only would that keep the feed sweet, but he considered it would considerably lessen the amount of sickness at present experienced. He was of the firm opinion that with the addition of sheep to the farm and careful management they would be able, in the course of a few years, to increase both the growth of cereal crops and natural grasses. At a further meeting, held on April 6th, the Hon. Secretary (Mr. W. J. Tylor) read an extract from the *Victorian Journal of Agriculture*, entitled "Sheep Shed and Yards Construction."

## WYNARKA.

March 23rd.—Present: five members and one visitor.

VARIETY AND MANURIAL TESTS.—The demonstration plots which had been conducted by members were discussed. Mr. C. W. Schultz, who had sown plots of Gluyas wheat (55lbs.) with different quantities of manure, reported the following results:—56lbs. super. yielded at the rate of 8bush. 16lbs. per acre; 80lbs. super., 9bush. 18lbs.; 112lbs. super., 9bush. 16lbs. A plot that was rolled yielded 8bush. 31lbs. per acre, as against a yield of 8bush. 16lbs. from a plot not so treated. Mr. V. Klose had also conducted manurial tests, the variety being Belgian Surprise, sown at the rate of 45lbs. per acre. The dressings of super. were at the rates of 50lbs., 80lbs., and 112lbs., and the returns 17bush. 25lbs., 19bush. 48lbs., and 21bush. 26lbs., respectively. Variety tests were undertaken by Mr. H. Hood, who sowed four different wheats at the rate of 50lbs. per acre, with 65lbs. of super. The yields recorded were:—Bunyip, 10bush., 40lbs.; King's White, 9bush. 53lbs.; Gluyas, 11bush., 24lbs.; Gluyas (Roseworthy College seed), 11bush. 36lbs.

BORRIKA, March 30th.—A discussion took place on the results of the recent harvest.

CLANFIELD, March 30th.—The meeting discussed the results of the 1917-18 harvest and the question of "Noxious Weeds."

COOMANDOOK, April 6th.—A paper dealing with "Olive-growing" was contributed by Mr. R. Upton.

NETHERTON, March 22nd.—A useful discussion took place on the questions of the "Ailments of the Horse" and the "Destruction of Weeds."

PINNAROO, March 22nd.—Extracts were read from the report of the Department for year ended June 30th, 1917. Messrs. F. H. Edwards having offered the use of a plot of ground for experimental plot work, a committee was formed to supervise the necessary work.

WOLOWA, March 28th.—The Branch, after having been in recess through the harvest months, held a meeting, which took the form of a "Question Box," when numerous subjects were dealt with.

## SOUTH AND HILLS DISTRICT.

## ASHBOURNE.

March 25th.—Present: 15 members.

SHEEP AND SHEEP-BREEDING.—A short paper on this subject was read by Mr. A. Cox, and a good discussion followed. The Hon. Secretary (Mr. J. H. Potter) reported on the recent fires in the district, and pointed out the need for combined action in fighting them. Mr. T. Kirkham also read a paper on "Fruit-growing," dealing particularly with the growing of apples. He described the method of planting an orchard, and gave a demonstration of pruning. Samples of various kinds of apples were exhibited by the writer, and the different varieties described.

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

March 18th.—Present: 12 members.

SPRAYING.—Mr. A. A. Magarey, in the course of a paper dealing with the subject of spraying, stated that the linking of distant places by better and faster means of communication had greatly facilitated the spread of insects and diseases of plants. Dealing with the control of these pests, he said:—"Though spraying is general in this country in orchards of any repute at all, much more could be done by taking better precautions (other than spraying) such as picking up and burning all prunings from fruit trees affected by fungus diseases, picking up and destroying same for codlin moth apples, and bandaging butts of trees and regularly inspecting same for grubs, and keeping trees vigorous and freely exposed to light and air by pruning, clean cultivation, and draining where necessary. Our regulations regarding spraying and checking orchard pests are either entirely inadequate, or are not enforced. How often does one see a grower spraying continuously and spending much time

and money in trying to eradicate codlin moth, for instance, with only a fence between him and a man whose property is infested with the moth. Why are these people not forced by law to spray at the right time, and as frequently as necessary by an efficient inspection? Or, if this is too expensive, why not cut out the present inspectors and thus save money now spent on a pretence? One of the greatest points in good spraying is to apply the spray at the correct time. The importance of this is often not fully realised. For instance, curl leaf in the peach. How often does one hear the spraying material blamed for failure to control this disease, when the fault nearly always lies in the fact that the spray was not applied at the right time? Last season four sprayings would have been necessary to keep a tree clean, as the buds opened very irregularly, and it is essential to spray the trees just as the leaf buds begin to burst. A very important item is the winter spray, which is neglected by many growers. I think if this is tried it will be found so beneficial that it will be continued. In the winter, shortly after the leaves have fallen, we have for the last six years sprayed stone fruit with Bordeaux, and we consider it one of the most important applications of that mixture for stone fruits. It will also be found beneficial in the control of fungus diseases, especially if some effective method of protection from rain and damp weather could be obtained. It has been suggested that the application of an oil spray immediately the Bordeaux is dry would have the desired effect, but I have had no experience of this. As the number of pests to be controlled increases, spraying will become more complicated, and so the need for improved methods will increase, and the necessity of combining fungicide and insecticide sprays will become more urgent. In America the plan of dusting on the mixtures in the form of powder has been tried, and it is claimed to be a very effective method of combining the two. Moreover, up to 40 acres of trees can be sprayed in a day with one machine, which enables more frequent applications to be made, and large areas covered at critical times. As there is no water required for the spray the outfit is a very light one, and may be operated by one man. If this method proves to be as effective as it is claimed to be, it should largely supersede the present spraying method in the near future, but this will of course depend on the price at which the necessary materials will be obtainable.

#### CYGNET RIVER.

March 28th.—Present: eight members.

DAIRYING.—In a paper dealing with this question Mr. F. J. Wakelin said that of the many different ways advocated for the management of cows it was very difficult to say which was the best method. He was quite satisfied that it did not pay to neglect a cow and then expect her to fill the milk bucket night and morning. In selecting good cows there was no particular breed that he could recommend, because there were good milk-producing cows in all breeds, but he preferred a heavy breed of cow so that at any time she would sell well as beef. In handling cows it was very important that they should not be excited. Dry milking did not commend itself to him. That method might be adopted with a cow that one could milk with a full hand, but the cow with very short teats would have to be milked with the thumb and finger, and dry milking in that fashion caused too much friction, and would very likely cause sore teats. If possible the cow should not be bailed when being milked. It was better to feed after milking rather than when milking operations were being carried out, because the cows were inclined to be restless. He considered that better returns would be obtained from the cows if green feed were grown for them. Members present agreed with the writer regarding wet milking under the circumstances expressed in the paper. The Hon. Secretary (Mr. C. T. Miller) always made a practice of feeding the cows whilst they were being milked, and had never experienced any trouble. He also considered that there should be a lucerne patch on every farm for the use of the animals and poultry.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

March 25rd.—Present: seven members and three visitors.

EGG-FARMING WITH WHITE LEGHORN FOWLS.—The monthly meeting of the Branch was held at the residence of Mr. W. P. Woolcock, when members inspected the orchard and garden. On the market garden plot an engine was working a pump. Mr. Woolcock also had a windmill attached to the same well, which could be worked when there was sufficient wind to drive it. By that plan a considerable saving in



petrol was effected. The water was forced up into a small dam on the hillside, and from there was conveyed to sprinklers amongst the vegetables. The following paper on "Egg-farming" was then contributed by Mr. E. W. Beythien:—"Given a good locality, not too far from a market centre, egg-farming, if carried out in a systematic and thoroughly businesslike manner, is by far the most profitable of all the various branches of poultry-farming. But it must always be remembered that the greater part of the profits depends, not so much on the actual value of egg returns per annum, as upon the difference between those values and the total amount of the food bill of the year. Therefore, as at the present time the general average of 1,200 to 1,500 well-bred White Leghorn hens may be gauged at from 180 to 200 eggs per bird per annum, the profits naturally depend upon how cheaply the birds can be fed without in any way affecting or lowering that average. Under these circumstances, to me it would seem sheer madness for anyone choosing a site on which to locate an egg farm to fix upon any place that has not attached to it at least two or three acres of well-watered, deep, rich soil, suitable for irrigation and intense cultivation. Green stuff must be grown in abundance, and fed daily all the year round. Green stuff does not mean weeds and rubbish of no feeding value, but green oats, barley, rye, maize, millet, clover, and lucerne, all of which, when chaffed, may be bulked in the wet mash with advantage both to the birds and the pocket. By this means the feed bill may safely be reduced by two-fifths, or with a flock of the numbers mentioned, the reduction would be about £160 per year. Although green stuff may be fed in abundance at mid-day, it has been my experience that no more than two-fifths can be fed in mash without the birds gradually losing condition, and a laying hen under no conditions must be allowed to lose condition. When birds are fed green stuff in mash to a greater extent than this they apparently, to the casual observer, lay as well as the others, but the expert will notice that they are gradually going off, and sooner or later the egg yield will suffer. With a good laying strain want of condition is largely responsible for early moulting, and as it is the average annual returns that count, it stands to reason that excessive green stuff must not be allowed to lower that average by forcing the birds into a moult two or even three months before the time they would have done so under other conditions. Roughly speaking it takes the first 100 eggs a bird lays each year to pay for her own food and that of the pullet that is being raised to take her place at the end of her term of usefulness. The egg-farmer's profits are derived from what is laid over and above this, consequently a great deal depends on the observation and judgment of the man who feeds, and that is why a careless man will never make a living at egg-farming. Given a good strain of birds and an abundance of green stuff, it is the man who feeds that makes for the profit and loss, as green stuff, when fed reasonably, can so considerably reduce the working costs. My preference is to give it in the wet mash, as it is only by giving it in this way that the birds can be induced to eat it in such quantities. Dry mash may have its benefits, and possibly the birds lay as well on this, if raised on it, but think of the cost when compared with the other—the difference itself is almost sufficient to provide a livelihood for a man. But, although greenstuff is so important in reducing the food bill, it may be safely said that success in egg-farming hinges greatly on a man's ability to raise strong, vigorous pullets. Many can hatch and brood chickens successfully in small numbers, but when thousands are to be dealt with each year it is quite a different question, as many know to their sorrow; and to make each year's pullets better than the parent stock is a very difficult matter. The breeding stock must have ancestors of good pedigrees and be selected for vigor and prepotency, with due regard to condition and maturity. No hen under two years of age is matured sufficiently to breed from when a man's living hangs on the results. Indiscriminate mating and the use of immature stock are at the root of nearly all the ills of the poultry yard, and certainly have a great deal to do with chick mortality. Therefore great attention should be given to the selection and mating of the stud birds. The hatching and brooding season occupies only a few months of each year, and not the slightest detail can be neglected during this time. The rest of the season greatly depends upon the number and also the conditions of the pullets reared. Personally, I favor the colony style of brooding, and for the past six or seven years I have successfully raised thousands of strong and lusty chicks around an ordinary Perfection oil stove. This method is labor saving, and if the lamp be run at high temperature to prevent overcrowding the mortality in ordinary circumstances should be low.

Ample floor room must be allowed so that the chicks may get away from the source of heat, if they wish. There must also be plenty of overhead ventilation, but no draughts from the floor. The sooner the chicks can do without artificial heat the better, as after a certain age it tends to weaken and lessen the vigor. As soon as cockerels, other than those to be kept for stud purposes, can be picked out, they should be disposed of, otherwise the food bill would be increased, and it would also be found that the pullets when kept by themselves would do much better. The pullets should never have a setback of any description, and daily attention given to their cleanliness and bodily comfort. Free range on grass or greenstuff is absolutely essential if strong and hardy stock is to be reared. The young birds must be well and heavily fed if they are to develop into strong layers. For the first month it will be found that dry mash is inferior to a good chick grain mixture, with a wet, crumbly mash, mixed with skim milk, fed twice a day. From the time they are a month old the ordinary laying ration of the hen should be fed, and also green stuff in order to distend the crop to its fullest extent. The crop of the young growing pullet must be expanded in this manner every day. Mash and green stuff is more easily assimilated, and is therefore the best for this purpose. As regards laying stock, during the first 12 months these should be forced as much as possible, because every egg counts in the final reckoning, and only from those birds that put up a good egg return and come out sound and vigorous should the next year's breeders be chosen. Many insist that no bird that has been forced for egg production during the first year should be chosen for breeding purposes, but I entirely disagree with this view, and consider that many weaklings are nursed into the breeding pens, that otherwise would have been easily culled out. Only by forcing at high pressure can the birds with stamina and sound constitutions be picked out with certainty, and these are the birds that are wanted, if a good sound flock of layers is to be built up. In feeding for egg production one should always bear in mind that the birds must be kept up in condition, or the egg yield will suffer. The appetites should therefore be stimulated to the fullest extent, and the birds encouraged to eat heavily of rich and easily-digested foods. This is one reason why I advocate feeding wet mash in the evening. When birds are given only a light feed of grain each morning, with abundance of green stuff at mid-day they are actually scratching all day, and work up a good appetite for the evening meal of mash, when they can pack their crops tightly with egg-producing food, which is so easily digested and assimilated that they sleep comfortably all night and wake next morning as keen as ever for the grain in the litter. Experiments have proved that only by the evening mash method can such quantities of rich foodstuffs be given without injurious results, and since adopting it I find that the flock lays well into April and May before moulting. This in itself is an item, for early moulters are of no use to an egg farmer. During the moult the birds are also fed heavily, not with the idea of egg production, but to build them up for the next year's work. Here again, with the evening mash method the birds can be conditioned in a short space of time without becoming over fat. Their activity in the litter during the day prevents this. It will be found that there is no work which responds to thoroughness and system so readily as that of the egg-producing farm, but one must be at all times punctual and gentle in the treatment of the birds."

#### MACGILLIVRAY (Average annual rainfall, 19in. to 20in.).

March 26th.—Present: seven members.

SCOTCH THISTLES.—Mr. A. J. Nicholls, in a paper dealing with this subject, said it was more the custom of people to condemn the growth of Scotch thistles than to praise them. He admitted that they were a source of great trouble in hay and other crops, but he thought there were several points to be declared in favor of them. First of all they opened the subsoil. Horses and cattle were very fond of them as a fodder, and cows pastured on the thistles during dry seasons would give better results than those feeding on dry grass. Sheep also seemed to have a liking for the thistles. To rid the crop of thistles he thought the best results would be secured if a fodder crop was sown and the stock allowed to eat it off. That plan and thorough cultivation, he thought, would eradicate them if they were not present in any very large numbers. Where exceptionally thick they should be cut with the mower and then raked into rows and burnt. Members who had stock found that

they provided fairly good fodder for horses and sheep, and were a good standby during seasons of drought. Other members who did more cropping, considered them a pest, and hard to eradicate. [The writer of the paper probably has in mind the Spear thistle, *Cirsium lanceolatum*, which is quite distinct from the Scotch thistle, which is not at all widely distributed in South Australia.—En.]

PORT ELLIOT (Average annual rainfall, 20.33in.).

March 16th.—Present: eight members.

FRUIT COLONIES FOR RETURNED SOLDIERS.—Mr. J. McLeod, in a paper on this question, said the land in the vicinity of Victor Harbor offered good opportunities for the settlement of returned soldiers. The land was well adapted for the cultivation of fruit, and had the advantages of good roads, and was easily accessible for the transport of their produce to the market. His plan would be to settle 50 men in one colony, and allot 30 acres to each man, 10 acres to be planted with fruit trees, principally apples, for export. The remaining area could be sown for hay and fodder crops. The homestead could be erected on a large block, and also the necessary outbuildings, such as stables, fruit sheds, piggery, and poultry run, etc. That scheme would require 1,500 acres. A recreation ground should also be provided upon which a hall should be erected. The same building could be used for church and school purposes. The cost of each block could be set out as follows:—Land, 30 acres, at £4 per acre, £120; clearing and planting 20 acres, at £10, £200; wire for fencing, £15; posts and erection of fences, £9, 12s. 6d.; four-roomed cottage and furniture, £250; two cows, at £15 each, one horse, dray, and harness, £40, £70; harrows and cultivator, £15; one sow, £3; 50 fowls, £3 15s.; rations and sundries for 12 months £102; total £788 7s. 6d., less £50 by sale of wood and posts, £738 7s. 6d. Next to be considered was the question of "terms." For the first five years the blocks could be "rent free," but the men should be bound to keep the blocks in good order. During the "rent free" period they should clear and plant two acres of the scrub land with pine trees for box-making, and the balance of the block should be fenced in. Money would be borrowed at 5 per cent., and that added to £738 would be £923. To meet the interest and pay back the principle would give a term of 40 years. Interest and principle payments would mean an annual rent of about £60. Five trustees or directors should be selected from practical fruitgrowers or producers, one of the members to be a Government fruit instructor, and the remaining four could be honorary members of the board and retire each third year with the right of re-election. Mr. H. Smith also reported on the Veterinary Lecturer's visit to Inman Valley.

STRATHALBYN (Average annual rainfall, 19.28in.).

March 26th.—Present: 18 members.

Mr. A. Burgess delivered a paper relating to the putting in of a crop of wheat. A lengthy discussion followed, when it was generally agreed that good plump grain should be sown. One bushel of seed to the acre was thought sufficient if the seed was sown early, but if later it would be advisable to use 1½ bush. Three inches apart was looked upon as being likely to produce the most regular and even crop. On April 10th the Government Veterinary Lecturer (Mr. F. E. Place) gave a veterinary demonstration to a large number of members and visitors on the local showgrounds. In the evening the lecturer delivered an address on "Worms in Sheep."

CHERRY GARDENS.—The meeting took the form of an "Exhibition Evening," when members tabled samples of local products.

KANMANTOO, April 20th.—A discussion on the "Co-operative Purchase of a Stud Bull" was brought forward, when it was proposed that a meeting of those interested be called for next Bureau night.

MEADOWS SOUTH, March 27th.—A paper under the heading of a "Trip Overland to Western Australia" was read by Mr. G. Griggs, in which he described some of the features of the overland route.

## SOUTH-EAST DISTRICT.

## COONAWARRA.

March 26th.—Present: 19 members and four visitors.

**LEAVES AND THEIR USES.**—Mr. J. Fowler, in a short paper on this subject, said the function of leaves was to enable the tree or plant to respire. On examining a leaf under a powerful microscope it would be found to contain evidence of the work for which Nature intended it. The technical description was as follows:—A thin, flattened expansion of epidermis, containing between its two layers vascular and cellular tissue, nerves and veins for the purpose of exhalation and respiration. The term "vascular" meant consisting of or containing vessels, and that of "cellular" consisting of cells. The vascular tissues were those small pipes or tubes which conveyed the juice from one part of the plant to another. For example, if the stalk of the rhubarb plant were broken, it would be found that many of the fibrils remained. The cellular tissues consisted of a number of small cells, which varied in shape, according to pressure, and sometimes assumed the form of honeycomb cells. The green coloring matter that entered into the leaves was termed "chlorophyl." The gas that animals expelled from their lungs as useless, the plants received through the medium of their leaves, absorbed that which was required for their wants, and exhaled the other portion, which was of no use to them, but was necessary to the existence of animal life. That provision of Nature made the trees perform the very necessary work of purifying the atmosphere. The carbonic acid gas that the leaves absorbed was that which was given off when any vegetable substance was burnt, especially was that the case with charcoal. The value of lime on soils was due, in a large extent, to the manner in which it readily absorbed the gas, thereby extracting from the atmosphere something of vital importance to the life of the plant. Thus it would be seen that as the bulk of the vegetable body was composed of carbon, as also was that of trees, and the major portion of that carbon had to be extracted from the atmosphere, what a very important part the leaves played in the life work of the tree. The leaves also served as evaporative organs by means of which the plant disposed of excessive moisture, and again in that respect they presented a striking analogy to animal life. Taking the apricot tree as an example it would readily be seen that in the treatment of that tree the preserving of the leaf system should be carefully watched over. If those results were wished for, that might reasonably be expected from a healthy tree, it was absolutely necessary that the leaves should be guarded against any fungus or insect pests that might seek to destroy them. The effect on a tree whose leaves were riddled with shothole or ruined with curl leaf could almost be likened to that of partial strangulation, and the system of the tree would suffer in consequence. It had been proved by experiment that Bordeaux mixture, fastened with a light oil spray, was one of the best fungicides in use.

**COLT-BREAKING.**—In a paper under this title Mr. A. Webber said a colt's education should commence when he was about a month old. At first it was best to tie the dam in a stall, after which there would be no difficulty in catching the foal, and when it understood that it would not be hurt, the foal would display a liking for being caught and handled. A leather halter should be put on, with a broad leather strap around the neck, and a tie-up rope attached. The rope should be run through the ring under the colt's chin, and then gently but firmly pulled first to one side and then the other. The colt and his dam should then be taken for a short walk, and that exercise repeated for a few days. When six months' old the colt should be weaned, when he could be taught to tie up. A broad leather strap around the neck should be used for that purpose, and the rope put through the halter ring. In the beginning the colt should be tied up short in a place where it was not possible for him to turn round. It was also a good training to lead him from his stall to water, but not to keep him tied up longer than two hours at a time. In muzzling a colt it was advisable to use a thick snaffle, with large rings, and attach it to the halter with a small bit snap on each side. About two hours should be allowed for the colt to become accustomed to the bit. In the absence of proper muzzling tackle a strong surcingle with a ring or buckle on each side might be used. Side reins could then be put on, but only pulled up sufficiently to bring the colt's head to the near side. After running round for an hour or so the reins might

be changed to the off side, and then gradually tightened until the colt was compelled to walk in a circle. That operation might be repeated for a few hours for two or three days, when the reins could be put on each side with both reins of equal length. He should be buckled fairly short, and kept moving for a while. When well mouthed, the colt should be led with a rein attached to the bit, and brought round, first on the near and then on the off side. In teaching the colt to back it was a mistake to jerk its mouth. The colt might then be put to light work. A good kicking rope should be provided, and the horse only given light work for the first few days.

#### KONGORONG.

March 26th.—Present: nine members.

**BUSH FIRES.**—An interesting discussion on this subject was opened by Mr. C. S. Atkin, who said in the interest of public property farmers should report those persons who lit fires without taking the necessary precautions. He considered that persons who intended burning should put an advertisement in the local paper at least three days beforehand. All members agreed with the views expressed by Mr. Atkin.

#### KYBYBOLITE (Average annual rainfall, 22in.).

February 26th.—Present: 15 members and one visitor.

**DAIRYING.**—Mr. R. A. Jenkins addressed the meeting on this question. Before purchasing the cows necessary for dairying, he said, one should make provision for a good supply of fodder. He was not in favor of any particular breed of cattle, but whatever type of cows were decided upon, one should endeavor to procure good stock and look after them properly. Heifers should be mated to come in at 2½ years to 3 years of age. He was opposed to the use of bails, and considered that if the heifers were hand-reared and carefully handled a month or so before coming in, very little trouble would be experienced. The speaker also exhibited a Babcock milk tester, and explained the working of it. He was of the opinion that no dairy farm was complete without some apparatus for testing the milk supply.

#### TANTANOOLA.

March 3rd.—Present: 14 members.

**PREPARATION OF THE SOIL IN THE DISTRICT OF TANTANOOLA.**—Mr. E. J. F. Altsch-wager, who contributed a paper on this subject, did not consider that any hard and fast rule could be laid down for the cultivation of the soil in that district, because the nature of the soil varied to a large extent. On the light soil he preferred to plough before the first rains to a depth of about 3½ in. to 4 in. If the soil was loose there would be no need to use the cultivator, but the harrows could be run over the ground three or four times after the weeds had commenced to grow. That practice could not be followed when working the heavier classes of soil, because one was not able to plough it before the first rains. If the land was ploughed about October or November the weeds would be killed before going to seed, but by fallowing in the spring a lot of valuable grass would be destroyed. All things considered he thought the land should be in good condition when seeding operations were commenced. After fallowing, the land should not be worked until the weeds started to show up, when it should be thoroughly harrowed. After a while, when the weeds again commenced to grow, the spring tooth cultivator should be used twice, going over the land in the opposite direction the second time of working. If the seed was sown in wet weather it was a good plan to work a set of harrows after the drill, to make certain that all the grain was covered. When preparing stubble land a good burn was essential if one wished for good results. Not only did that destroy large quantities of troublesome weeds, but also enabled one to make a much better job of ploughing.

## **AUSTRALIA'S SOLVENCY**

Depends on the Increased Production of  
**FARMS, FACTORIES and MINES.**

**BUY**

## **"SUNSHINE" FARM MACHINERY**

**HUGH VICTOR McKAY'S FAMOUS  
FARM IMPLEMENTS and ENGINES  
are**

**"ALL AUSTRALIAN"**

Made in Australia by Australians, to suit Australian conditions, from iron ore mined at Iron Knob, South Australia, treated at Newcastle, N.S.W., and manufactured at Sunshine, Victoria.

The "Sunshine" industry employs directly and indirectly thousands of Australians who help pay Australian taxes.

### **Keep Your Money in Australia.**

The bugbear of the farmer is taxation.—If money is kept in Australia there will be less taxation. "Sunshine" can supply the bulk of your requirements in Farm Machinery, and "Sunshine" products merit your support.

**Write for Catalogues. — — — Call and Inspect.**

**H. V. McKAY,** "Sunshine" Showrooms,  
56, North Terrace, Adelaide.

**WALLAROO-**  
**MOUNT LYELL**  
**SUPER!**

*It pays you best*

## **MALTHOID ROOFING !**

Best Roof for Australian Climatic  
Conditions.

Best Roof for Bungalows.

Best Fire-Resistant Roof.

Best for Promenade or Garden  
Flat Roof.

Expert advice. Price and particulars free.

**COLTON, PALMER, and**  
**PRESTON, Limited,**  
General Ironmongers and Merchants,  
**CURRIE ST. - ADELAIDE.**

## POULTRY BREEDERS.

---

On application (personal or by letter) to the Poultry Expert, Adelaide, Advice on Feeding, Breeding, Housing, and Diseases, &c., will be given.

Arrangements made for Lectures in Country Districts, and Visits of Inspection paid to Poultry Yards and Farms.

**Publications.**—On application Breeders' names will be placed on the Mailing List.

Monthly Notes in *The Journal of Agriculture*; subscription 1s. per annum, posted; 2s. 6d. Inter-State.

---

### GOVERNMENT POULTRY STATION—PARAFIELD.

Inspection is invited of Stock and Methods Adopted.

---

**PUBLIC VISITING DAYS**—1st Wednesday and 4th Saturday in each Month.

---

### EGGS AND POULTRY FOR LOCAL MARKET AND FOR EXPORT.

Instruction as to Age, Weight, and Methods of Fattening Poultry for the English and Local Markets.

**EGGS.**—Further particulars on application.

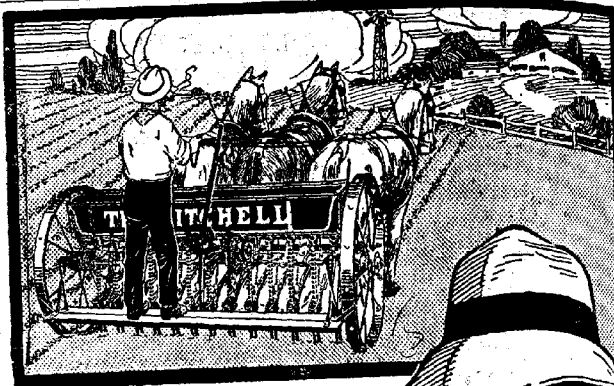
Please address all correspondence—

**THE POULTRY EXPERT,**

TELEPHONES { 6464  
                  { 6465.

**ADELAIDE.**





## 1,200 Acres in 4 Seasons and 5/- for Repairs

Such is the remarkable evidence of Mr. E. H. Ubergang, of Horsham, whose letter reads as follows:—"I cannot speak too highly of its general excellence, the change gears especially working splendidly. I have worked a 'Mitchell' for four seasons, doing 1,200 acres, and it cost me only five shillings for repairs."

The proof of the supreme  
quality of the

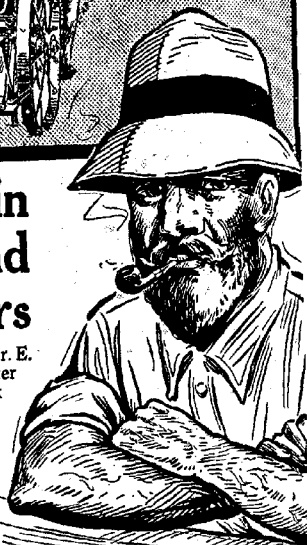
# MITCHELL DRILL

is that certain manufacturers are copying it in as many ways as possible, and three of recent make are straight out copies entirely. Remember, the "Mitchell" Patent Devices are obtainable only IN the original Mitchell Drill, such as Removable Wheel Bushes, Wheels cannot spread, Unerring Grain Feed, Strongest and Surest Manure Feed, Quantities changed by speed, all Adjustments from the rear. The 1918 Model is still more durable, still lighter in draught, and still easier to operate.

Write for Particulars and Prices.

**S.A. Farmers' Co-operative Union Ltd.**

32 Franklin Street, Adelaide, South Australia.



## Roseworthy Agricultural College.

WALTER J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S.,  
Principal.

### SUBJECTS:

Agriculture, Veterinary Science, Dairying, Aviculture.  
Viticulture, Wine-making, and Fruit Culture.  
Chemistry, Mathematics, Botany, English, Book-keeping.  
Surveying and Wool-classing.  
Manual Practice on Farm, Vineyard, Orchard, and in Dairy  
Wine Cellars, and Farm Workshop.

### FEES:

£30 per annum (including board and lodging) and £1 for  
medical fees, payable *pro rata* at the beginning of each  
session.

### SCHOLARSHIPS:

Six, each valued at £90, open for competition annually.

### SESSIONS:

The course of study extends over nine sessions, or three years.

The FIRST SESSION of each year begins on or about the third  
Wednesday in April and closes on or about the third  
Friday in July.

The SECOND SESSION opens on or about the second Tuesday  
after the close of the first session and closes on or about  
the second Friday in October.

The THIRD SESSION opens on or about the second Tuesday after  
the close of the second session, and closes at the comple-  
tion of the vintage.

---

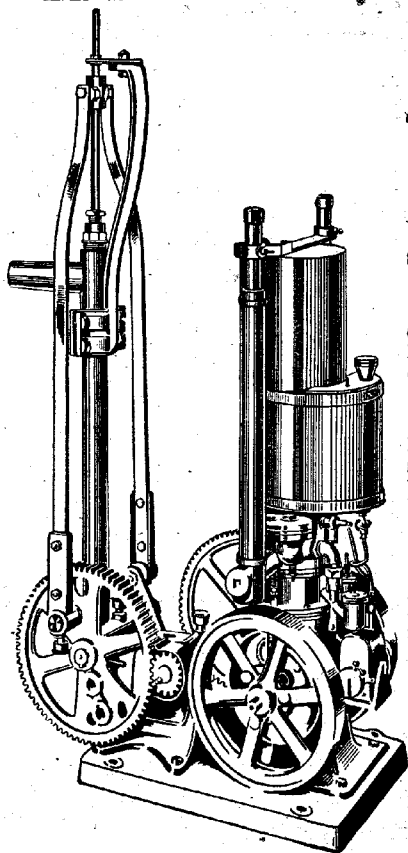
*Applications for Prospectus and information should be addressed to—*

THE SECRETARY,

AGRICULTURAL COLLEGE,

ROSEWORTHY.

# COOPER Little Giant



## The Cooper "LITTLE GIANT" Pumping Outfit.

Strong and thoroughly practical.

Consists of a strong high-grade 2 H.P. Engine and substantial all-metal Pump Jack with high-grade cut gears.

It is very compact, and is designed to give long years of service, to run with very little attention, and to operate at a very small cost of upkeep.

The engine can be instantly detached and used for other work, such as driving chaffcutter, wood-saw, winnower, &c.

The "Little Giant" Pumping Outfit will lift water from wells or bores up to 200 ft. deep. It has attained a record throughout Australia never before equalled.

Write for Further Information

SOLE AGENTS—

**The Australasian Implement & House Furnishing Co.**

(R. H. White, Manager)

(G. P. Harris, Scarfe & Co., Ltd., Proprietors)

**ADELAIDE**

# TOP BRAND



**THE  
TRUEST      SUPER      VALUE.**

Manufacturers,  
**THE ADELAIDE CHEMICAL & FERTILIZER CO., LTD.,**  
Currie Street, Adelaide.

---

**OVER 5,000 FARMERS**

**are members of the**

**Agricultural Bureau,**

**ARE YOU?**

If not, join a Branch at once. If the nearest Branch is not within reasonable distance of your Home, write to the Department of Agriculture for particulars as to how to form a Branch.

**It is to your interest to do so.**

# CROWN LANDS.

---

## APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

---

## ALLOTMENTS, SALES, TRANSFERS, SUBLEASES, AND MORTGAGES.

Notice is hereby given that in future no applications for land, or for transfer, sublease, or mortgage of Crown leases or agreements will be approved to unnaturalised persons of any nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

Where any doubt as to nationality exists, it will be necessary for certificate of birth or naturalisation papers to be exhibited.

The same principle will apply to land sold by auction.

---

## OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

---

## NOTICE TO APPLICANTS FOR LAND.

The Land Board meets daily (when necessary) at the Board's Office, Department of Lands, to deal with applications received the previous day for any lands that may be open in the Official List. Applicants must either attend personally or send a full-written statement. Forms can be obtained at Post Offices, or on application to the Secretary for Lands.

E. A. ANSTEY,

*Commissioner of Crown Lands and Immigration.*

